SINAMICS G120C

Frequency inverter

Getting Started · 01/2011

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SINAMICS G120C Frequency inverter

Getting Started

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Commissioning 4

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Trouble shooting 6

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Legal information

Warning notice system

This manual contains notices you have to observe in order to ensure your personal safety, as well as to prevent damage to property. The notices referring to your personal safety are highlighted in the manual by a safety alert symbol, notices referring only to property damage have no safety alert symbol. These notices shown below are graded according to the degree of danger.

⚠DANGER
indicates that death or severe personal injury **will** result if proper precautions are not taken.

⚠WARNING
indicates that death or severe personal injury **may** result if proper precautions are not taken.

⚠CAUTION
with a safety alert symbol, indicates that minor personal injury can result if proper precautions are not taken.

CAUTION
without a safety alert symbol, indicates that property damage can result if proper precautions are not taken.

NOTICE
indicates that an unintended result or situation can occur if the corresponding information is not taken into account.

If more than one degree of danger is present, the warning notice representing the highest degree of danger will be used. A notice warning of injury to persons with a safety alert symbol may also include a warning relating to property damage.

Qualified Personnel

The product/system described in this documentation may be operated only by **personnel qualified** for the specific task in accordance with the relevant documentation for the specific task, in particular its warning notices and safety instructions. Qualified personnel are those who, based on their training and experience, are capable of identifying risks and avoiding potential hazards when working with these products/systems.

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Note the following:

⚠WARNING
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℗ 01/2011

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Safety notes

1

It has to be ensured by the machine manufacturer, that the line-side overcurrent protection equipment interrupts within 5 s (immovable equipment and modules in immovable equipment) in the case of minimum fault current (current on complete insulation failure to accessible conductive parts that are not live during operation and maximum current loop resistance).

Electrical shock

⚠ DANGER

Hazardous voltage is still present for up to 5 minutes after the power supply has been switched off.

It is not permissible to carry out any installation work before this time has expired!

⚠ WARNING

This equipment contains dangerous voltages and controls potentially dangerous rotating mechanical parts.

Protection in case of direct contact by means of SELV / PELV is only permissible in areas with equipotential bonding and in dry indoor rooms. If these conditions are not fulfilled, other protective measures against electric shock must be applied e.g. protective insulation.

The inverter must always be grounded. As the earth leakage for this product can be greater than 3.5 mA a.c., a fixed earth connection is required and the minimum size of the protective earth conductor shall comply with the local safety regulations for high leakage current equipment.

Install the inverter on a metal mounting plate. The mounting plate has to be unpainted and with a good electrical conductivity.

It is strictly prohibited for any mains disconnection to be performed on the motor-side of the system, if the inverter is in operation and the output current is not zero.

Take particular notice of the general and regional installation and safety regulations regarding work on dangerous voltage installations (e.g. EN 50178) as well as the relevant regulations regarding the correct use of tools and personal protective equipment (PPE).

ESD protection

⚠ CAUTION

Static discharges on surfaces or interfaces that are not generally accessible (e.g. terminal or connector pins) can cause malfunctions or defects. Therefore, when working with inverters or inverter components, ESD protective measures should be observed.

Transport and storage

⚠ CAUTION

The level of physical shocks and vibration during transport and storage must correspond to class 2M3 according to EN 60721-3-2. It is important that the equipment is protected from water (rainfall) and excessive temperatures.

Installation and Commissioning

⚠WARNING

Wherever faults occurring in the control equipment can lead to substantial material damage or even grievous bodily injury (that is, potentially dangerous faults), additional external precautions must be taken or facilities provided to ensure or enforce safe operation, even when a fault occurs (e.g. independent limit switches, mechanical interlocks, etc.).

Operation

⚠WARNING

Emergency Stop facilities according to EN 60204, IEC 204 (VDE 0113) must remain operative in all operating modes of the control equipment. Any disengagement of the Emergency Stop facility must not lead to an uncontrolled or an undefined restart of the equipment.

⚠WARNING

Filtered drives can only be used on power systems with grounded starpoint.

⚠CAUTION

This equipment is suitable for use in a power system up to 10,000 symmetrical amperes (rms), for the maximum rated voltage + 10 % when protected by an appropriate standard fuse (refer to the catalogue for the type of fuse).

Risk of fire

⚠WARNING

If an unsuitable braking resistor is used, this could result in a fire and severely damage, people, property and equipment. It is essential that not only the correct braking resistor is used, but it is installed correctly according to the instructions delivered with the braking resistor.

The temperature of braking resistors increases significantly during operation. For this reason, avoid coming into direct contact with braking resistors. Maintain sufficient clearances around the braking resistor and ensure that there is adequate ventilation.

Repair

⚠WARNING

Repairs on equipment may only be carried out by Siemens Service, by repair centers authorized by Siemens or by authorized personnel who are thoroughly acquainted with all the warnings and operating procedures contained in this manual.

Any defective parts or components must be replaced using parts contained in the relevant spare parts list.

Introduction

2

This Getting Started Guide describes how you do the installing and basic commissioning of the SINAMICS G120C inverter.

2.1 SINAMICS G120C inverter

The SINAMICS G120C is a range of inverters for controlling the speed of three phase motors. The inverter is available in three frame sizes.

	Rated output power	Rated output current	Order number			
	based on Low Overload		Unfiltered		Filtered	
Frame Size A	0.55 kW	1.7 A	6SL3210-1KE11-8U	0	6SL3210-1KE11-8A	0
	0.75 kW	2.2 A	6SL3210-1KE12-3U	0	6SL3210-1KE12-3A	0
	1.1 kW	3.1 A	6SL3210-1KE13-2U	0	6SL3210-1KE13-2A	0
	1.5 kW	4.1 A	6SL3210-1KE14-3U	0	6SL3210-1KE14-3A	0
	2.2 kW	5.6 A	6SL3210-1KE15-8U	0	6SL3210-1KE15-8A	0
	3.0 kW	7.3 A	6SL3210-1KE17-5U	0	6SL3210-1KE17-5A	0
	4.0 kW	8.8 A	6SL3210-1KE18-8U	0	6SL3210-1KE18-8A	0
Frame Size B	5.5 kW	12.5 A	6SL3210-1KE21-3U	0	6SL3210-1KE21-3A	0
	7.5 kW	16.5 A	6SL3210-1KE21-7U	0	6SL3210-1KE21-7A	0
Frame Size C	11.0 kW	25.0 A	6SL3210-1KE22-6U	0	6SL3210-1KE22-6A	0
	15.0 kW	31.0 A	6SL3210-1KE23-2U	0	6SL3210-1KE23-2A	0
	18.5 kW	37.0 A	6SL3210-1KE23-8U	0	6SL3210-1KE23-8A	0
		USS, Modbus RTU		B		B
		PROFIBUS DP		P		P
		CANopen		C		C

2.2 Commissioning tools

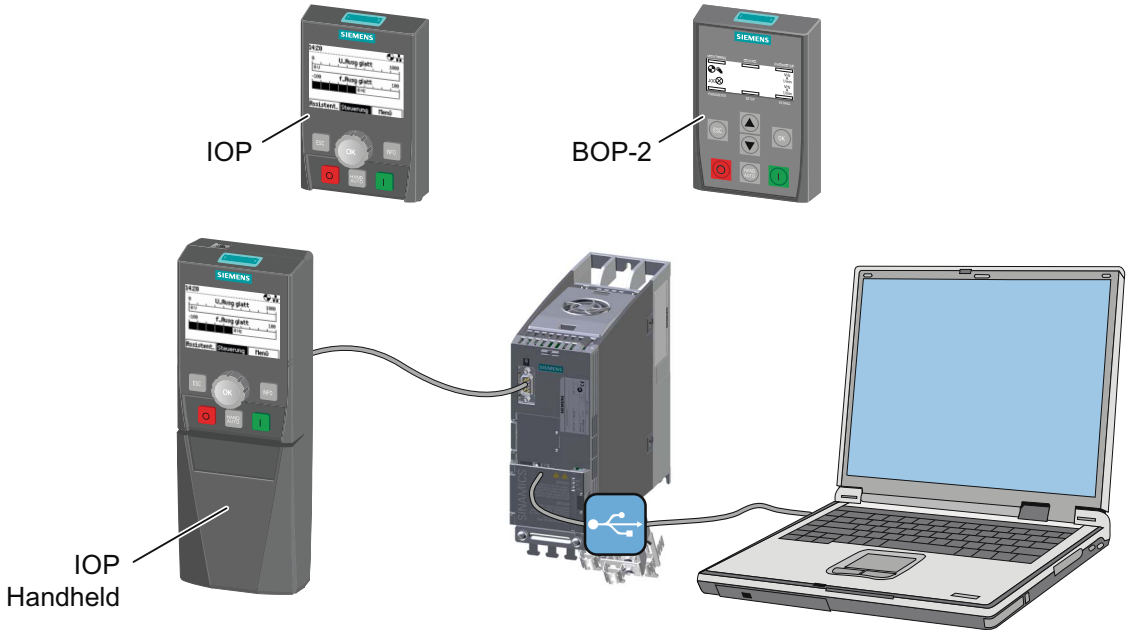


Table 2- 1 Components and tools for commissioning and data backup

Component or tool			Order number
Operator Panels	BOP-2 - snapped on the inverter.		6SL3255-0AA00-4CA1
	IOP - snapped on the inverter or used with the handheld.		6SL3255-0AA00-4JA0
	IOP Handheld.		6SL3255-0AA00-4HA0
	IOP/BOP-2 Mounting Kit IP54/UL Type 12.		6SL3256-0AP00-0JA0
STARTER	Commissioning tool (PC software) - connected to the inverter using an USB cable.		You obtain STARTER on a DVD (Order number: 6SL3072-0AA00-0AG0) and it can be downloaded: Starter download (http://support.automation.siemens.com/WW/view/en/10804985/133100)
PC Connection Kit	Comprising STARTER DVD and USB cable.		6SL3255-0AA00-2CA0
Drive ES Basic	For commissioning the inverter via PROFIBUS interface. Implements STARTER.		6SW1700-5JA00-4AA0
	Optional memory card for storing and transferring the inverter settings	MMC card	6SL3254-0AM00-0AA0
		SD card	6ES7954-8LB00-0AA0

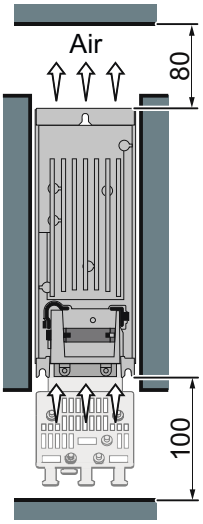
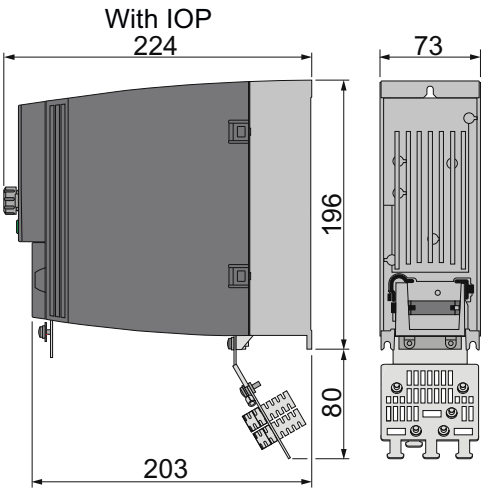
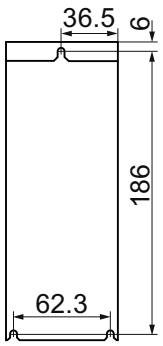
Installing

3

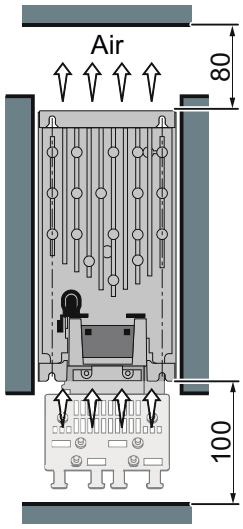
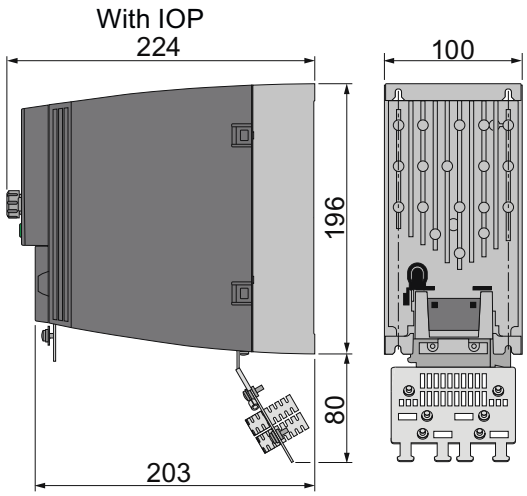
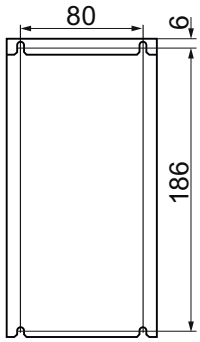
3.1 Dimensions

Dimensions, drill patterns and minimum distances

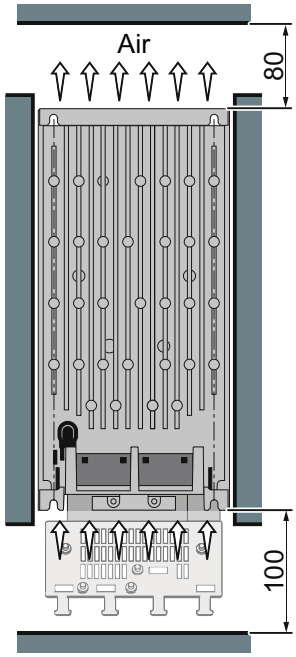
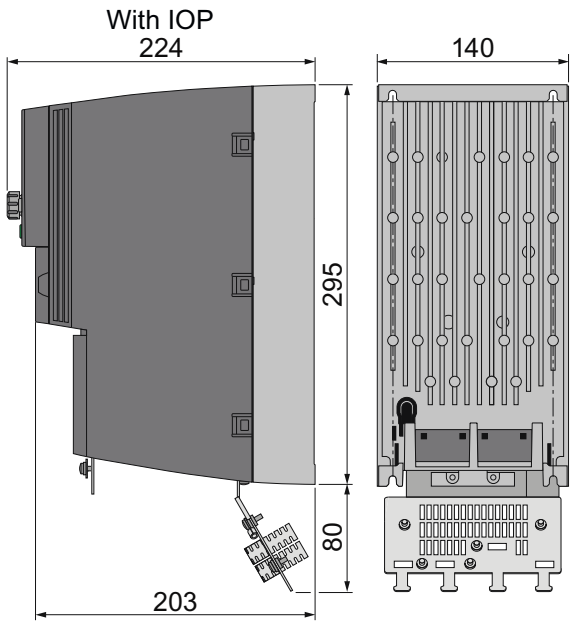
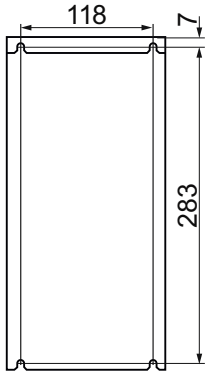
Frame Size A, 0.55 kW ... 4.0 kW

Distances to other equipment [mm]	Dimensions [mm]	Drill pattern [mm]
		 Fixings: 3 x M4 bolts 3 x M4 nuts 3 x M4 washers Tightening torque: 2.5 Nm

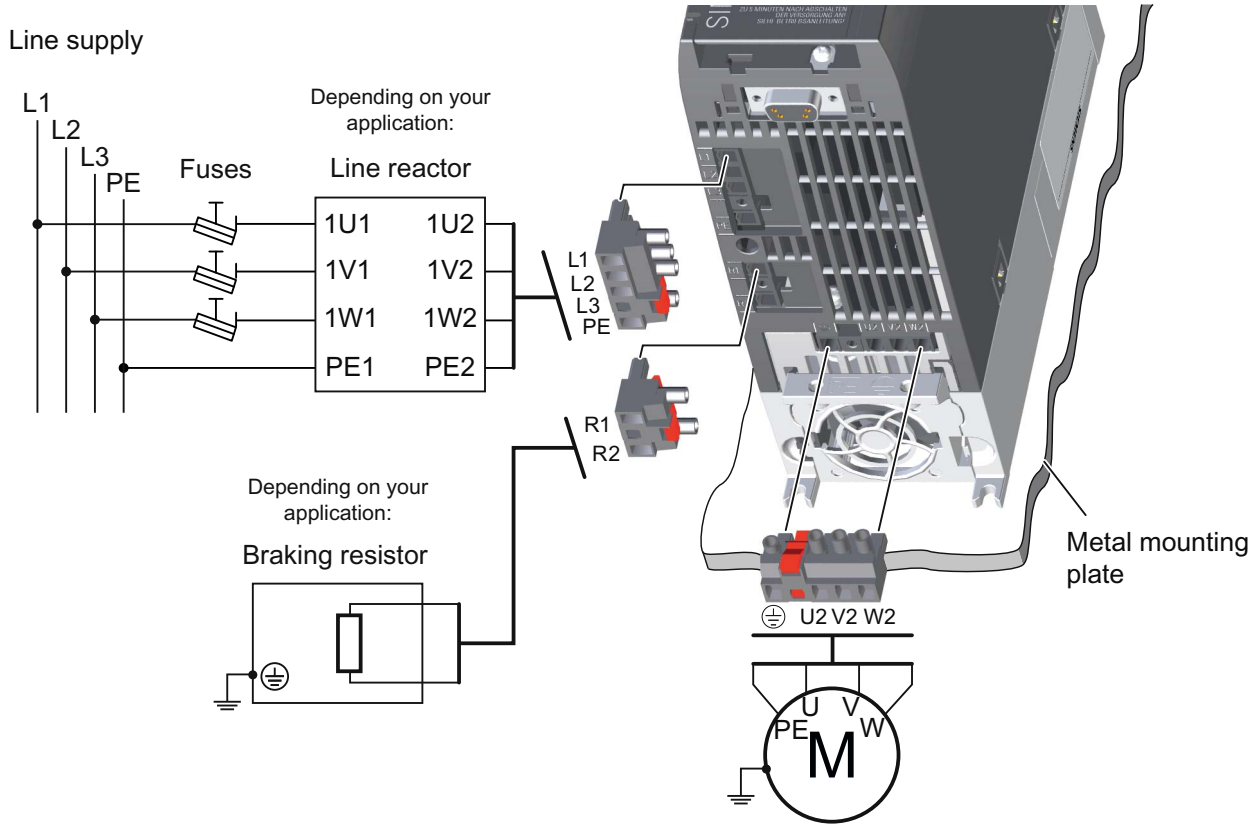
Frame Size B, 5.5 kW … 7.5 kW

Distances to other equipment [mm]	Dimensions [mm]	Drill pattern [mm]
		 Fixings: 4 x M4 bolts 4 x M4 nuts 4 x M4 washers Tightening torque: 2.5 Nm

Frame Size C, 11 kW … 18.5 kW

Distances to other equipment [mm]	Dimensions [mm]	Drill pattern [mm]
		 Fixings: 4 x M5 bolts 4 x M5 nuts 4 x M5 washers Tightening torque: 2.5 Nm

3.2 Power connections



	Permissible cable cross section (tightening torque)			
Inverter frame size	Mains supply and motor		Braking resistor	
FSA, 0.55 kW … 4.0 kW	2.5 mm² (0.5 Nm)	14 AWG (4.4 lbf in)	2.5 mm² (0.5 Nm)	14 AWG (4.4 lbf in)
FSB, 5.5 kW … 7.5 kW	6 mm² (0.6 Nm)	10 AWG (5.3 lbf in)	2.5 mm² (0.5 Nm)	14 AWG (4.4 lbf in)
FSC, 11.0 kW … 18.5 kW	16 mm² (1.5 Nm)	5 AWG (13.3 lfb in)	6 mm² (0.6 Nm)	10 AWG (5.3 lbf in)

Table 3- 1 External components of the inverter

Inverter Frame Size (FS) and rated power		Standard fuse type	Fuse type acc. UL and cUL	Braking resistor for dynamic braking	Line reactor for reducing line-side harmonic currents
FSA	0.55 kW … 1.1 kW	3NA3801 (6 A)	10 A class J	6SL3201-0BE14-3AA0	6SL3203-0CE13-2AA0
	1.5 kW	3NA3803 (10 A)	10 A class J		6SL3203-0CE21-0AA0
	2.2 kW			6SL3201-0BE21-0AA0	
	3.0 kW	3NA3805 (16 A)	15 A class J		
	4.0 kW				
FSB	5.5 kW	3NA3807 (20 A)	20 A class J	6SL3201-0BE21-8AA0	6SL3203-0CE21-8AA0
	7.5 kW	3NA3810 (25 A)	25 A class J		
FSC	11.0 kW	3NA3817 (40 A)	40 A class J	6SL3201-0BE23-8AA0	6SL3203-0CE23-8AA0
	15.0 kW	3NA3820 (50 A)	50 A class J		
	18.5 kW	3NA3822 (63 A)	60 A class J		

Components for United States / Canadian installations (UL/cUL)

In order that the system is UL/cUL-compliant, use UL/cUL-certified J-type fuses, overload circuit-breakers or intrinsically safe motor protection devices. For each frame size A to C use class 1 75° C copper wire only.

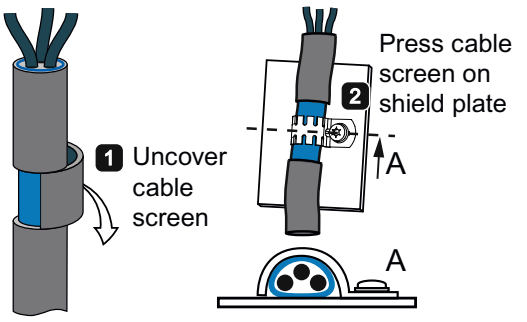
Install the inverter with any external recommended suppressor with the following features:

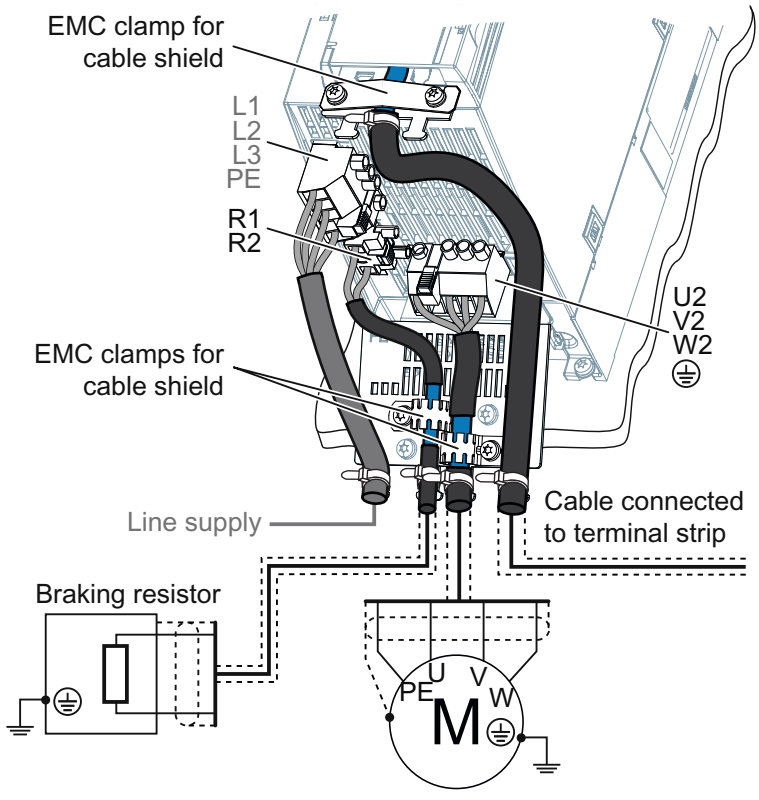
- Surge-protective devices; device shall be a Listed Surge-protective device (Category code VZCA and VZCA7)
- Rated nominal voltage 480/277 V_{AC}, 50/60 Hz, 3-phase
- Clamping voltage V_{PR} = 2000 V, I_N = 3 kA min, MCOV = 550 V_{AC}, SCCR = 40 kA
- Suitable for Type 1 or Type 2 SPD application
- Clamping shall be provided between phases and also between phase and ground

EMC compliant installation

Rules for EMC-compliant installation:

- Install the inverter on a metal mounting plate. The mounting plate has to be unpainted and with a good electrical conductivity.
- Use shielded cables for the following connections:
  - Motor and motor temperature sensor
  - Braking resistor
  - Process interfaces (Field bus, digital and analog inputs and outputs)
- Use a clamp for connecting each shielded cable. Connect the shield to the mounting plate or to the shield plate through a good electrical connection and through the largest possible surface area.





Screening example for inverter frame size A

3.3 Process and user interfaces

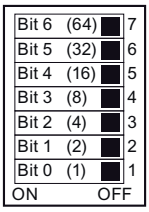
① Memory card slot (MMC or SD cards)

② Interface for operator panel (BOP-2 or IOP)

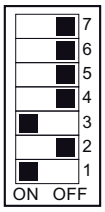
③ USB interface for STARTER

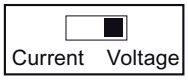
④ Status LEDs

⑤ DIP switches for bus address

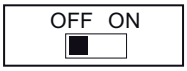


Example:
Address = 5



⑥ Analog input DIP switch 

⑦ Depending on field bus

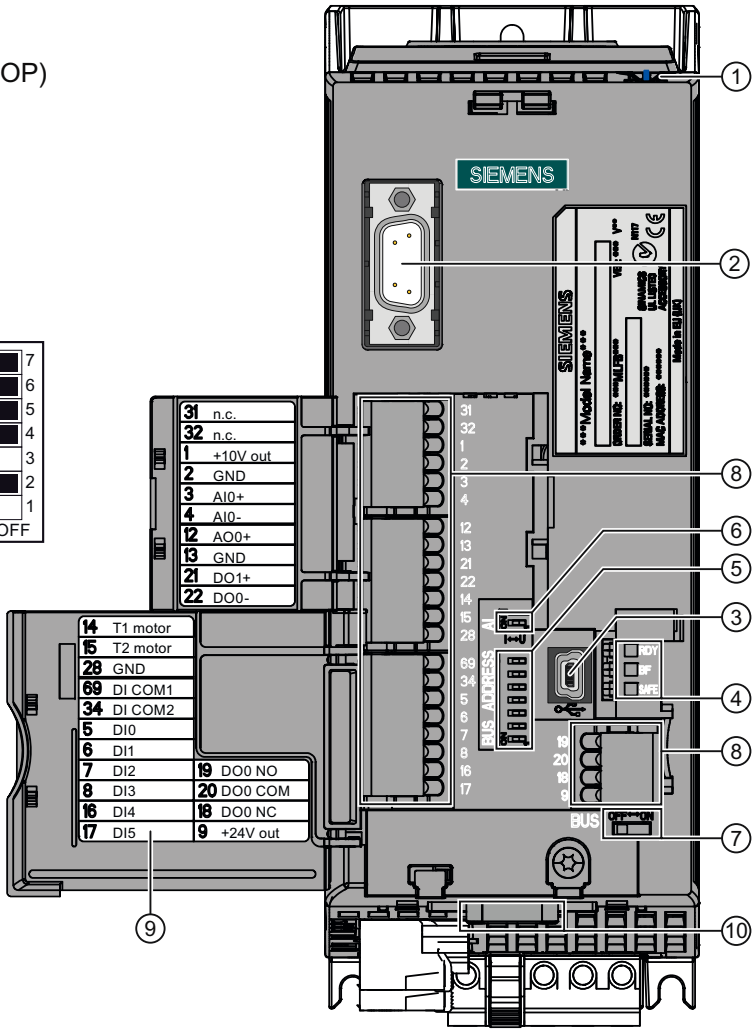
G120C USS/MB and G120C CAN:
Bus termination 

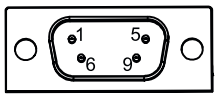
G120C DP: no function

⑧ Terminal strips

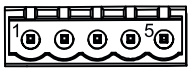
⑨ Terminal designations

⑩ Field bus interface

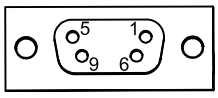


CANopen 

1 Not used
2 CAN_L, CAN-signal (dominant low)
3 CAN_GND, CAN-reference
4 Not used
5 (CAN _SHLD), optional cable shield
6 (GND), optional CAN-reference
7 CAN_H, CAN-signal (dominant high)
8 Not used
9 Not used

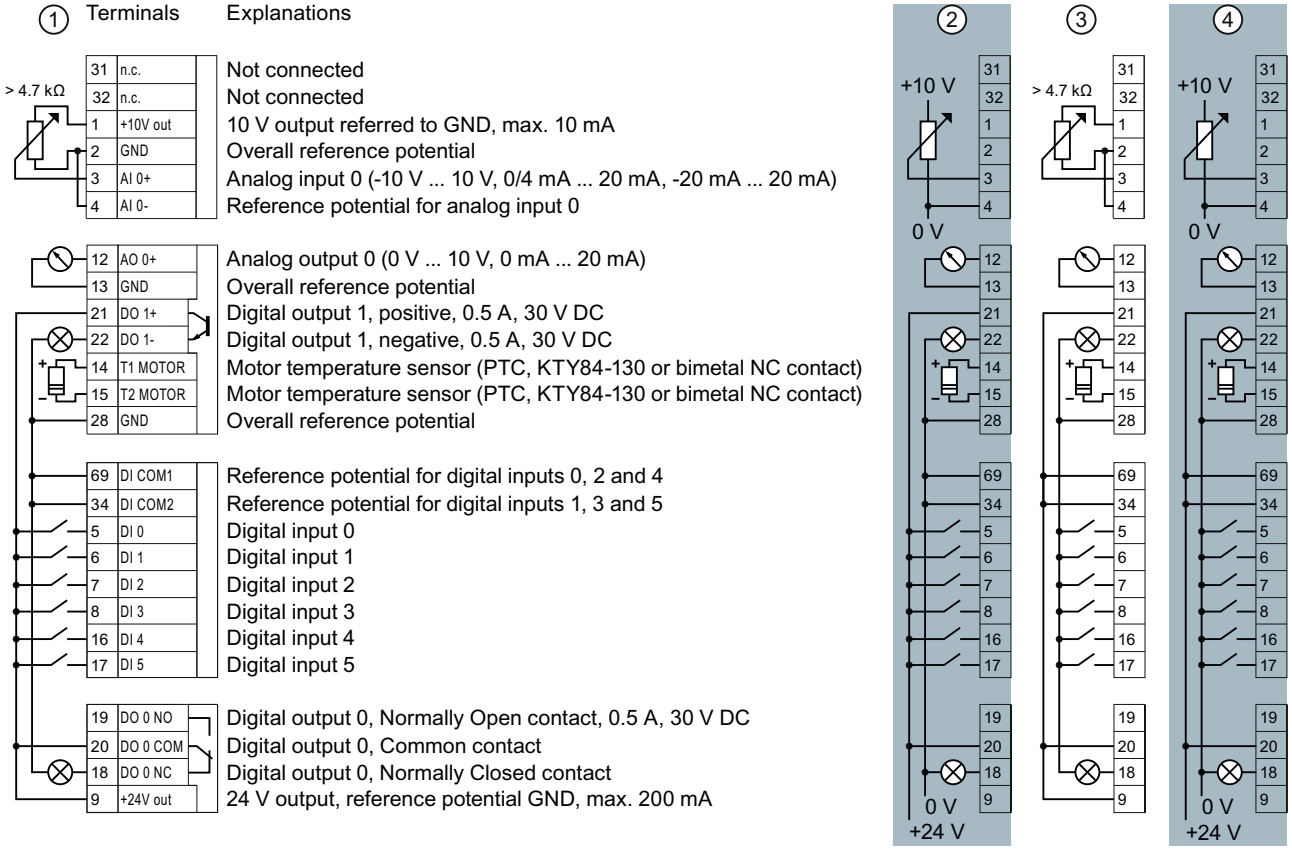
USS or Modbus RTU 

1 0 V, reference potential
2 RS485P, Receive and send (+)
3 RS485N, Receive and send (-)
4 Cable shield
5 Not used

PROFIBUS 

1 Shield, ground connection
2 Not used
3 RxD/TxD-P, receive/send data P(B/B')
4 CNTR-P, control signal
5 DGND, data reference potential (C/C')
6 VP, supply voltage positive
7 Not used
8 RxD/TxD-N, receive/send data N(A/A')
9 Not used

3.4 Terminal strips on the inverter


① Terminals
Explanations
> 4.7 kΩ
31 n.c.
32 n.c.
1 +10V out
2 GND
3 AI 0+
4 AI 0-
Not connected
Not connected
10 V output referred to GND, max. 10 mA
Overall reference potential
Analog input 0 (-10 V ... 10 V, 0/4 mA ... 20 mA, -20 mA ... 20 mA)
Reference potential for analog input 0
12 AO 0+
13 GND
21 DO 1+
22 DO 1-
14 T1 MOTOR
15 T2 MOTOR
28 GND
Analog output 0 (0 V ... 10 V, 0 mA ... 20 mA)
Overall reference potential
Digital output 1, positive, 0.5 A, 30 V DC
Digital output 1, negative, 0.5 A, 30 V DC
Motor temperature sensor (PTC, KTY84-130 or bimetal NC contact)
Motor temperature sensor (PTC, KTY84-130 or bimetal NC contact)
Overall reference potential
69 DI COM1
34 DI COM2
5 DI 0
6 DI 1
7 DI 2
8 DI 3
16 DI 4
17 DI 5
Reference potential for digital inputs 0, 2 and 4
Reference potential for digital inputs 1, 3 and 5
Digital input 0
Digital input 1
Digital input 2
Digital input 3
Digital input 4
Digital input 5
19 DO 0 NO
20 DO 0 COM
18 DO 0 NC
9 +24V out
Digital output 0, Normally Open contact, 0.5 A, 30 V DC
Digital output 0, Common contact
Digital output 0, Normally Closed contact
24 V output, reference potential GND, max. 200 mA
② ③ ④
+10 V
0 V
> 4.7 kΩ
0 V
+24 V

Wiring variants

①	Wiring using the internal power supply	Digital input = HIGH if switch closed
②	Wiring using an external power supply	Digital input = HIGH if switch closed
③	Wiring using the internal power supply	Digital input = LOW if switch closed
④	Wiring using an external power supply	Digital input = LOW if switch closed

Permissible cable cross-section:	0.5 mm² (21 AWG) … 1.5 mm² (16 AWG)
Recommended cable cross section:	1 mm² (18 AWG)

EMC-compliant installation

- Use shielded cables for connecting the terminal strip to other components.
- Use a clamp for connecting the shielded cable. Connect the shield to the mounting plate or to the shield plate through a good electrical connection and through the largest possible surface area. The handling of shielded cables is shown in section Power connections (Page 11).

3.5 Pre-defined I/O-configuration

The inverter offers different pre-defined settings for its interfaces. Choose the appropriate setting (macro) and wire the terminal strips according to the chosen setting.

If none of the pre-defined settings suites your application completely, do the following steps:

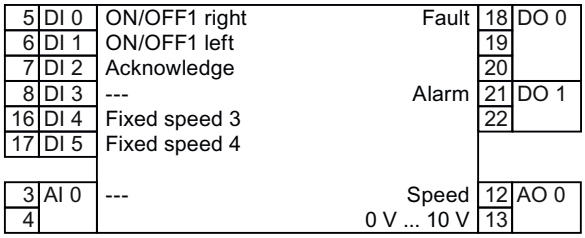
1. Wire the terminal strips according to your application.
2. Choose the best fitting setting (macro).
3. Set your chosen macro during basic commissioning.
4. Change the function of the inappropriate terminals.

Fixed speeds

Macro 1

Two fixed speeds

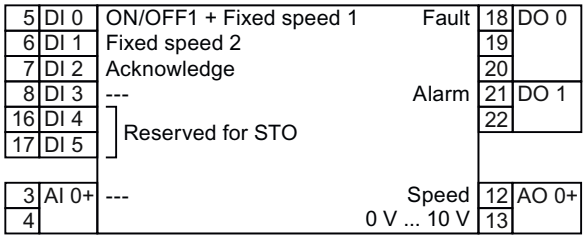
p1003 = Fixed speed 3
p1004 = Fixed speed 4
DI 4 and DI 5 = HIGH:
Inverter adds fixed speed 3 + fixed speed 4



Macro 2

Two fixed speeds with safety function (STO)

p1001 = Fixed speed 1
p1002 = Fixed speed 2
DI 0 and DI 1 = HIGH:
Motor runs with fixed speed 1 + fixed speed 2

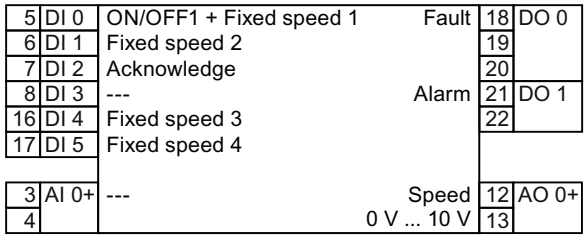


You have to release STO, see section: Releasing "Safe Torque Off" (Page 24).

Macro 3

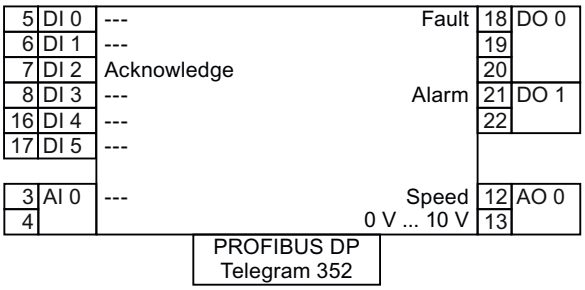
Four fixed speeds

p1001 = Fixed speed 1
p1002 = Fixed speed 2
p1003 = Fixed speed 3
p1004 = Fixed speed 4
Several DI = HIGH:
Inverter adds according fixed speeds



Macro 4

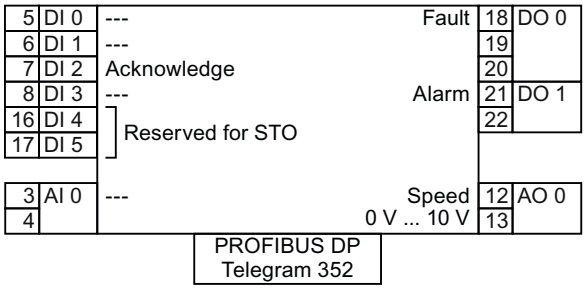
Field bus PROFIBUS DP



For getting the GSD file, see section: Getting the GSD file (Page 24).

Macro 5

Field bus PROFIBUS DP
with safety function (STO)

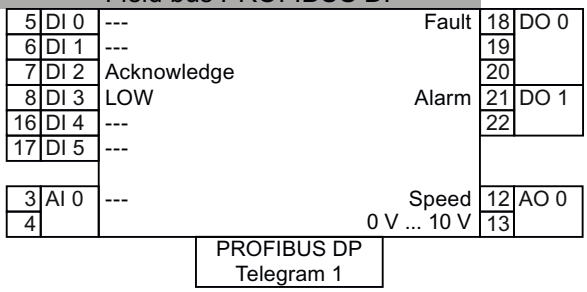


You have to release STO, see section: Releasing "Safe Torque Off" (Page 24). For getting the GSD file, see section: Getting the GSD file (Page 24).

Automatic / Manual - change over from field bus to jog

Factory setting with G120C DP:

Macro 7 DI 3 = LOW
Field bus PROFIBUS DP



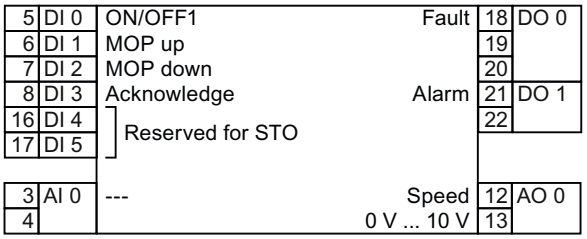
DI 3 = HIGH
Jog via DI 0 and DI 1

For getting the GSD file, see section: Getting the GSD file (Page 24).

Motorized potentiometer

Macro 8

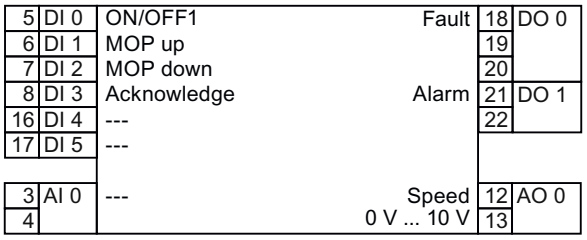
Motorized potentiometer (MOP)
with safety function (STO)



You have to release STO, see section: Releasing "Safe Torque Off" (Page 24).

Macro 9

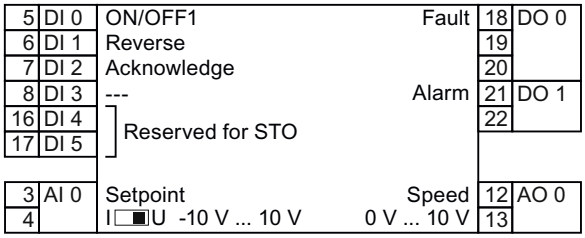
Motorized potentiometer
(MOP)



Analog setpoint

Macro 13

Safety function (STO)

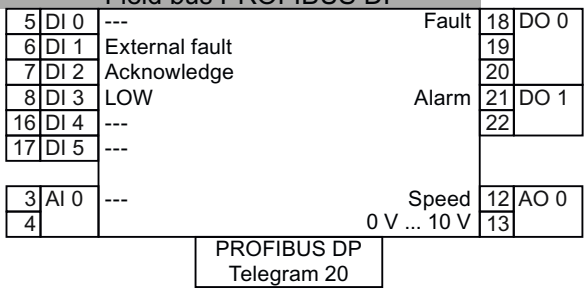


You have to release STO, see section Releasing "Safe Torque Off" (Page 24).

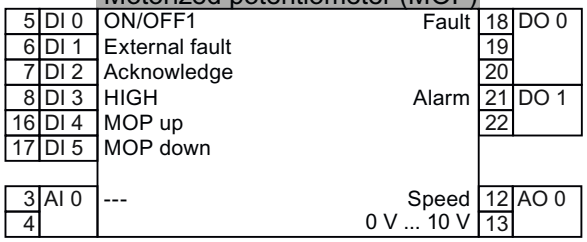
Process industry

Macro 14

DI 3 = LOW
Field bus PROFIBUS DP



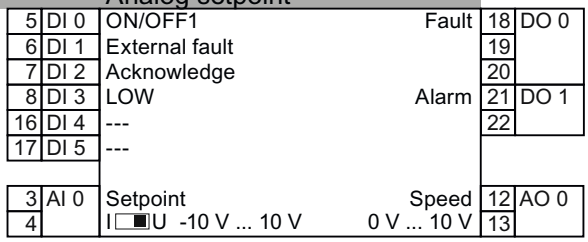
DI 3 = HIGH
Motorized potentiometer (MOP)



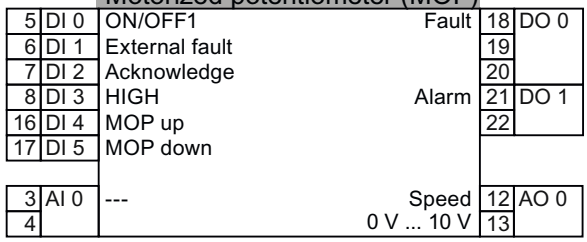
For getting the GSD file, see section: Getting the GSD file (Page 24).

Macro 15

DI 3 = LOW
Analog setpoint



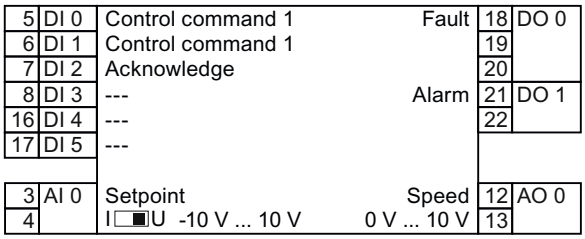
DI 3 = HIGH
Motorized potentiometer (MOP)



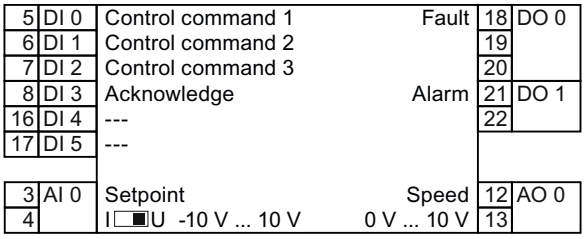
Two or three wire control

Macro 12 is factory setting with the G120C USS/MB and G120C CAN.

	Macro 12	Macro 17	Macro 18
Two wire control	Mode 1	Mode 2	Mode 3
Control command 1	ON/OFF1	ON/OFF1 right	ON/OFF1 right
Control command 2	Reverse	ON/OFF1 left	ON/OFF1 left



	Macro 19	Macro 20
Three wire control	Mode 1	Mode 2
Control command 1	Release/ OFF1	Release/ OFF1
Control command 2	ON right	ON
Control command 3	ON left	Reverse

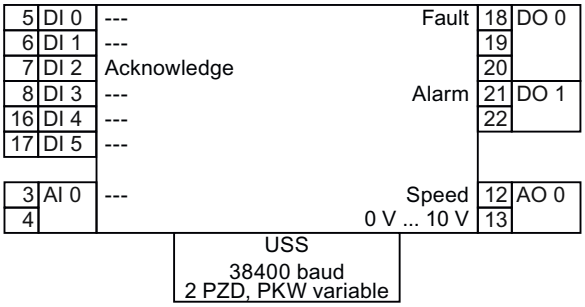


Communication with the higher-level control via USS

Macro 21

Field bus USS

p2020 = baud rate
p2022 = PZD number
p2023 = PKW number



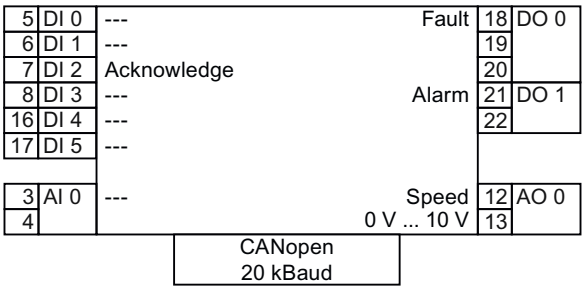
You find more information on USS in the "Operating Instructions" of your inverter.

Communication with the higher-level control via CANopen

Macro 22

Field bus CANopen

p8622 = baud rate



You find more information on CANopen in the "Operating Instructions" of your inverter.

Commissioning

4

Commissioning with IOP

The commissioning with the IOP can be done intuitively by using the commissioning wizards and the help texts included in the IOP. For further information refer to the IOP Operating Instructions.

Commissioning with STARTER

The most important steps:

- Connect the PC to the inverter via USB and start the STARTER tool.
- Choose the project wizard (menu "Project / New with assistent")
  - In the project wizard choose "Find drive units online"
  - Select USB as interface (Access point of the application: "DEVICE …", interface parameter assignment used: "S7USB")
  - Finish the project wizard.
- STARTER has now created your project and inserted a new drive
- Select the drive in your project and go online
- In your drive open the "Configuration" mask (double click)
- Start basic commissioning with the "Assistent" button

For further information refer to inverter operating instructions.

Commissioning with BOP-2

Remove the blind cover and snap the BOP-2 on the inverter:

Insert BOP-2

Remove BOP-2

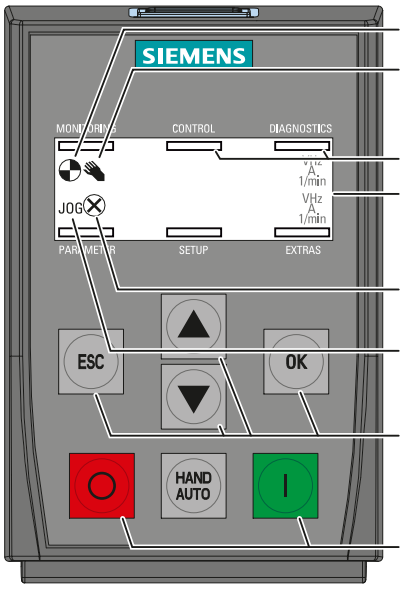
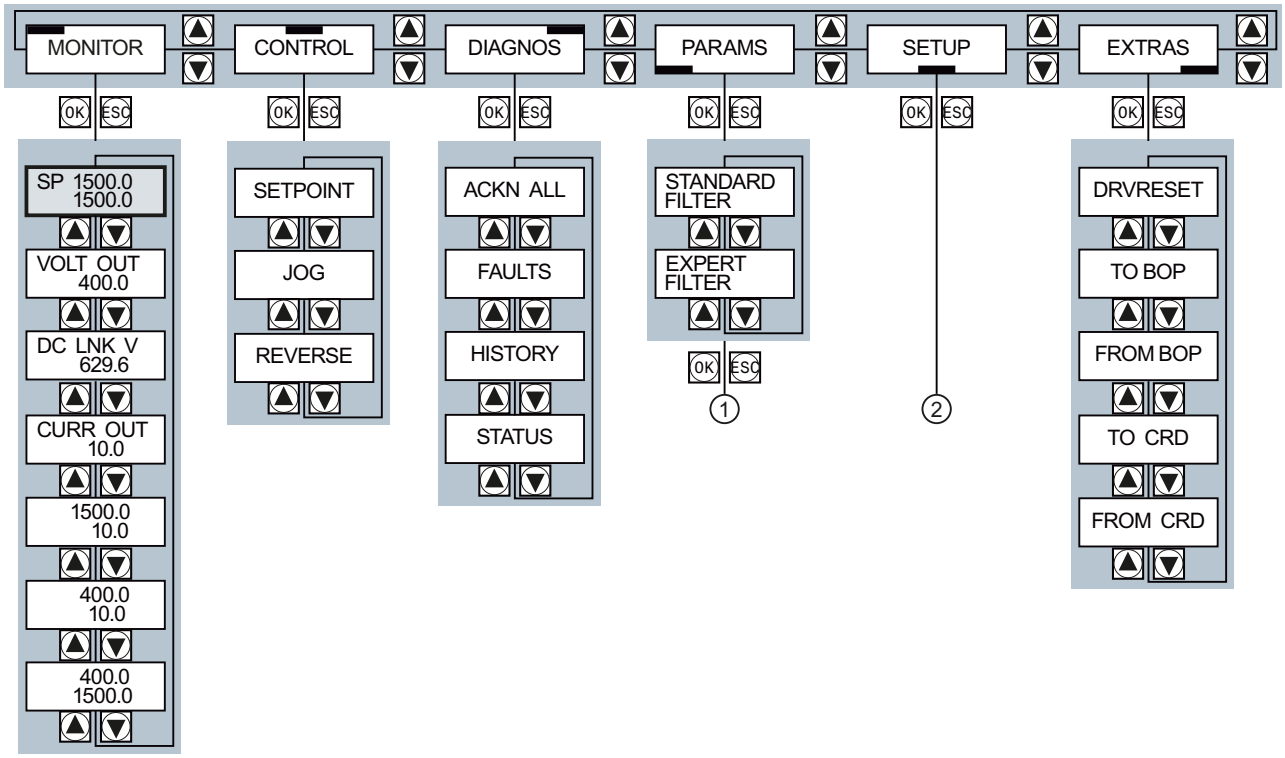


Figure 4-1 Operator control and display elements of the BOP-2

4.1 BOP-2 menu structure



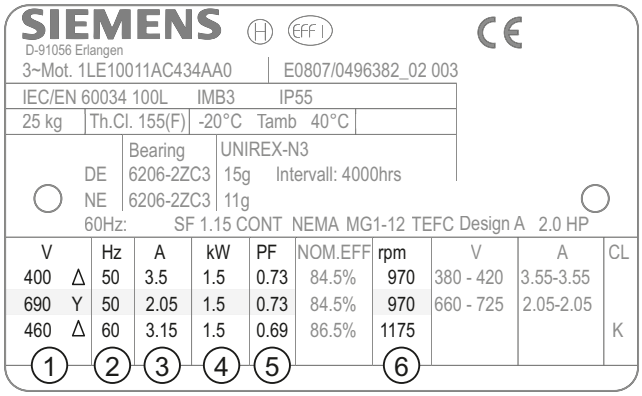
Changing parameter values:

① Parameter number freely selectable

② Basic commissioning

4.2 Basic commissioning

Menu		Remark
SETUP OK		Set all parameters for the "SETUP" menu. In the BOP-2, select the menu "SETUP".
ESC RESET OK		Select Reset if you wish to reset all parameters to the factory setting before the basic commissioning: NO → YES → OK
CTRL MOD p1300 OK		Select the motor control mode. The most important control modes are:
	VF LIN	V/f control with linear characteristic
	VF QUAD	V/f control with square-law characteristic
	SPD N EN	Closed loop speed control (vector control)
EUR USA p100 OK		② Standard: IEC or NEMA
MOT VOLT p304 OK		① Voltage
MOT CURR p305 OK		③ Current
MOT POW p307 OK		④ Power IEC standard (kW) ⑤ Power NEMA standard (HP)
MOT RPM p311 OK		⑥ Rated speed
MOT ID p1900 OK		We recommend the setting STIL ROT (Identify motor data at standstill and with the motor rotating). If the motor cannot rotate freely, e.g. where travel is mechanically limited, select the setting STILL (Identify motor data at standstill).
MAC PAR p15 OK		Select the configuration for the inputs and outputs, as well as the correct fieldbus for your application. The predefined configurations can be found in the section titled Pre-defined I/O-configuration (Page 15).
MIN RPM p1080 OK		Minimum motor speed.
RAMP UP p1120 OK		Motor ramp-up time.
RAMP DWN p1121 OK		Motor ramp-down time.
FINISH OK		Confirm that the basic commissioning has been completed (Parameter p3900): NO → YES → OK



Motor data on the rating plate

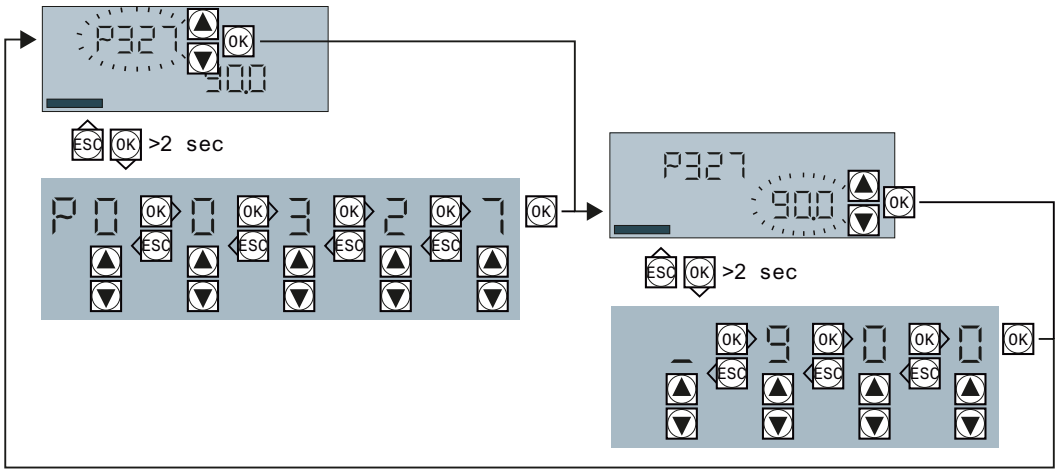
Identifying motor data

If you select the MOT ID (p1900) during basic commissioning, alarm A07991 will be issued once basic commissioning is complete. To enable the inverter to identify the data for the connected motor, you must switch on the motor (e.g. via the BOP-2). The inverter switches off the motor after the motor data identification has been completed.

⚠ CAUTION
Motor data identification for dangerous loads Secure dangerous plant and system parts before starting the motor data identification, e.g. by fencing off the dangerous location or lowering a suspended load to the floor.

4.3 Freely selecting and changing parameters

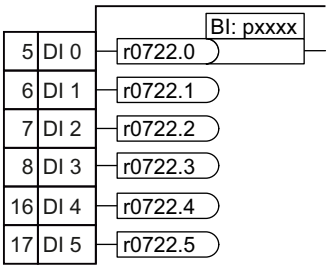
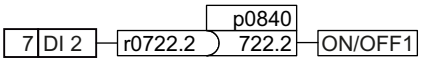
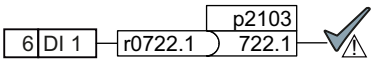
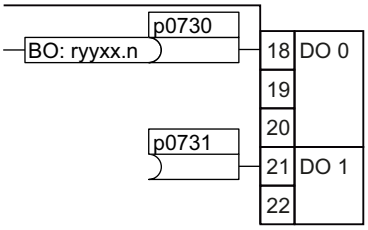
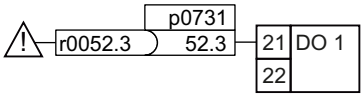
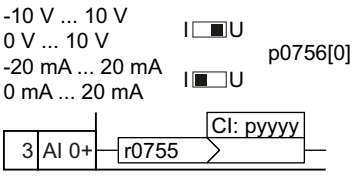
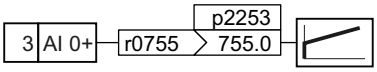
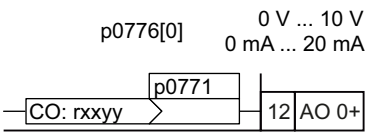
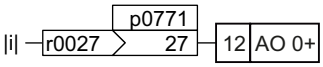
Use BOP-2 to change your inverter settings, by selecting the appropriate parameter number and changing the parameter value. Parameter values can be changed in the "PARAMS" menu and the "SETUP" menu.



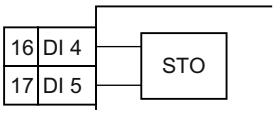
Select the parameter number		Changing a parameter value	
If the parameter number flashes in the display, you have two options for changing the number:		If the parameter value flashes in the display, you have two options of changing the value:	
1. option:	2. option:	1. option:	2. option:
Increase or decrease the parameter number using the arrow keys until the number you want is displayed.	Press and hold the OK key for more than two seconds and change the required parameter number digit by digit.	Increase or decrease the parameter value using the arrow keys until the value you want is displayed.	Press and hold the OK key for more than two seconds and enter the required value digit by digit.
Confirm the parameter number using the OK key.		Confirm the parameter value using the OK key.	

The inverter immediately saves all changes which you made using the BOP-2 so that they are protected against power failure.

4.4 Changing the function of terminals

<table>
<tr><th>Terminals</th><th></th><th>Changing the function</th><th>Examples</th></tr>
<tr><td>Digital inputs</td><td rowspan="2"> 
</td><td rowspan="2">1. Select the desired function indicated by a "BI"-parameter.
2. Set this parameter to the value of the status parameter r0722.x of the desired digital input.</td><td>Function: Switch on the motor with DI 2.
Setting: p0840 = 722.2
 
</td></tr>
<tr><td>Function: Acknowledge faults with DI 1.
Setting: p3981 = 722.1
 
</td></tr>
<tr><td>Digital outputs</td><td> 
</td><td>1. Select the desired function indicated by a "BO"-parameter.
2. Set the parameter p073x of the desired digital output to the value of the "BO"-parameter.</td><td>Function: Signal "fault" on DO 1.
Setting: p0731 = 52.3
 
</td></tr>
<tr><td>Analog input</td><td> 
</td><td>1. Select the desired function indicated by a "CI"-parameter.
2. Set this parameter to the value of the status parameter r0755 of the analog input.</td><td>Function: AI 0 provides setpoint for the PID controller.
Setting: p2253 = 55[0]
 
</td></tr>
<tr><td colspan="3">Use p0756[0] and the I/U switch on the inverter front for adjusting the analog input as voltage or current input.</td></tr>
<tr><td>Analog output</td><td> 
</td><td>1. Select the desired function indicated by a "CO"-parameter.
2. Set the parameter p0771 of the analog output to the value of the "CO"-parameter.</td><td>Function: Signal "current" on AO 0.
Setting: p0771 = 27
 
</td></tr>
<tr><td colspan="3">Use p0776[0] for adjusting the analog input as voltage or current input.</td></tr>
</table>

4.5 Releasing "Safe Torque Off"

Terminals		Set the following parameters for releasing STO:	
Fail-safe digital input		p9761 = …	Enter password for fail-safe function (factory setting = 0)
		p9762 = …	Enter new password, if required (0 … FFFF FFFF)
		p9763 = …	Confirm new password
		p0010 = 95	Enter commissioning of fail-safe functions
		p9601 = 1	STO is selected via terminal strip
		p9659 = …	Set the forced checking procedure timer (8 h … 1 year). To fulfill the requirements of standards EN 954-1, ISO 13849-1 and IEC 61508 regarding timely error detection, the inverter must regularly test its safety-relevant circuits to ensure that they function correctly.
		p9700 = 208	Copy fail-safe parameters
		p9701 = 220	Confirm fail-safe parameters
		p0010 = 0	Finish commissioning of fail-safe functions

4.6 Getting the GSD file

The GSD is a description file for a PROFIBUS slave. You have two options for obtaining the GSD of your inverter:

1. You can find the SINAMICS inverter GSD on the Internet (http://support.automation.siemens.com/WW/view/en/22339653/133100).
2. The GSD is saved in the inverter. The inverter writes its GSD to the memory card if you insert the memory card in the inverter and set p0804 to 12. Using the memory card, you can then transfer the GSD to your PG/your PC.

Parameter list

5

The following list contains the basic parameter information with access level 1 … 3. The complete parameter list is provided in the list manual, see Further information (Page 44).

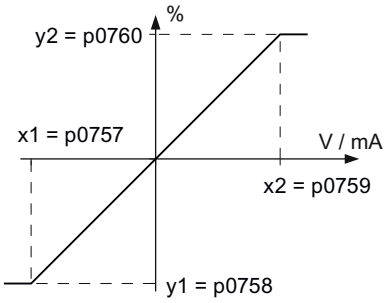
P-No.	Note	
Operation and visualization		
r0002	Drive operating display	
p0003	Access level	
p0010	Drive, commissioning parameter filter	
p0015	Macro drive unit See also Pre-defined I/O-configuration (Page 15).	
r0018	Control Unit firmware version	
r0020	Speed setpoint smoothed [100 % ≙ p2000]	
r0021	CO: Actual speed smoothed [100 % ≙ p2000]	
r0022	Speed actual value rpm smoothed [rpm]	
r0024	Output frequency smoothed [100 % ≙ p2000]	
r0025	CO: Output voltage smoothed [100 % ≙ p2001]	
r0026	CO: DC link voltage smoothed [100 % ≙ p2001]	
r0027	CO: Absolute actual current smoothed [100 % ≙ p2002]	
r0031	Actual torque smoothed [100 % ≙ p2003]	
r0032	CO: Active power actual value smoothed [100 % ≙ r2004]	
r0034	Motor utilization [1 ≙ 100 %]	
r0035	CO: Motor temperature [100 °C ≙ 100 %]	
r0036	CO: Power unit overload I^2t [1 ≙ 100 %]	
r0039	Energy consumption	
	1	Reset the energy consumption display
p0040	Reset energy consumption display	
r0041	Energy usage saved/energy saved	
p0045	Smoothing time constant, display values [ms]	
r0046	CO/BO: Missing enable signals	
r0047	Motor data identification routine and speed controller optimization	
r0050	CO/BO: Command Data Set CDS effective	
r0051	CO/BO: Drive Data Set DDS effective	
r0052	CO/BO: Status word 1	
	.00	Ready to start
	.01	Ready
	.02	Operation enabled
	.03	Fault active
	.04	Coast down active (OFF2)
	.05	Quick stop active (OFF3)
	.06	Closing lockout active
	.07	Alarm active
	.08	Deviation, setpoint/actual speed
	.09	Control requested
	.10	Maximum speed reached
	.11	I,M,P limit reached
	.12	Motor holding brake open
	.13	Alarm overtemperature motor
	.14	Motor rotates forwards
	.15	Alarm converter overload
r0053	CO/BO: Status word 2	
r0054	CO/BO: Control word 1	
	.00	ON/OFF1
	.01	OFF2
	.02	OFF3
	.03	Enable ramp-function generator
	.04	Enable ramp-function generator
	.05	Continue ramp-function generator
	.06	Enable speed setpoint
	.07	Acknowledge fault
	.08	Jog bit 0
	.09	Jog bit 1
	.10	Master control by PLC
	.11	Direction reversal (setpoint)
	.13	Motorized potentiometer, raise
	.14	Motorized potentiometer, lower
	.15	CDS bit 0
r0055	CO/BO: Supplementary control word	
	.00	Fixed setpoint, bit 0
	.01	Fixed setpoint, bit 1
	.02	Fixed setpoint, bit 2
	.03	Fixed setpoint, bit 3
	.04	DDS selection, bit 0
	.05	DDS selection, bit 1
	.08	Technology controller enable
	.09	DC braking enable
	.11	Droop enable
	.12	Closed-loop torque control active

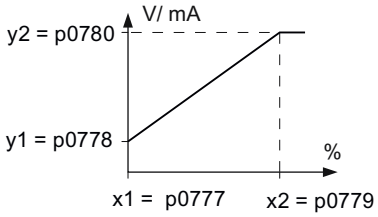
P-No.	Note	
	.13	External fault 1 (F07860)
	.15	CDS bit 1
r0056	CO/BO: Status word, closed-loop control	
r0060	CO: Speed setpoint before setpoint filter [100 % ≙ p2000]	
r0062	CO: Speed setpoint after filter [100 % ≙ p2000]	
r0063	CO: Speed actual value unsmoothed [100 % ≙ p2000]	
r0064	CO: Speed controller system deviation [100 % ≙ p2000]	
r0065	Slip frequency [100 % ≙ p2000]	
r0066	CO: Output frequency [100 % ≙ p2000]	
r0067	CO: Output current, maximum [100 % ≙ p2002]	
r0068	CO: Absolute current actual value unsmoothed [100 % ≙ p2002]	
r0070	CO: Actual DC link voltage [100 % ≙ p2001]	
r0071	Maximum output voltage [100 % ≙ p2001]	
r0072	CO: Output voltage [100 % ≙ p2001]	
r0075	CO: Current setpoint field-generating [100 % ≙ p2002]	
r0076	CO: Current actual value field-generating [100 % ≙ p2002]	
r0077	CO: Current setpoint torque-generating [100 % ≙ p2002]	
r0078	CO: Current actual value torque-generating [100 % ≙ p2002]	
r0079	CO: Torque setpoint, total [100 % ≙ p2003]	
Commissioning		
p0100	IEC/NEMA motor standard	
	0	IEC motor (50 Hz, SI units)
	1	NEMA motor (60 Hz, US units)
	2	NEMA motor (60 Hz, SI units)
p0170	Number of Command Data Sets (CDS)	
p0180	Number of Drive Data Sets (DDS)	
Power Module		
p0201	Power unit code number	
r0204	Power unit, hardware properties	
p0205	Power unit application	
	0	Load cycle with high overload
	1	Load cycle with light overload
r0206	Rated power unit power [kw/hp]	
r0207	Rated power unit current	

P-No.	Note	
r0208	Rated power unit line supply voltage [V]	
r0209	Power unit, maximum current	
p0210	Drive unit line supply voltage [V]	
p0230	Drive filter type, motor side	
	0	No filter
	1	Motor reactor
	2	dv/dt filter
	3	Siemens sine-wave filter
	4	Sine wave filter, third-party manufacturer
p0233	Power unit motor reactor [mH]	
p0234	Power unit sine-wave filter capacitance [µF]	
r0238	Internal power unit resistance	
p0278	DC link voltage undervoltage threshold reduction [V]	
p0287	Ground fault monitoring thresholds [100 % ≙ r0209]	
r0289	CO: Maximum power unit output current [100 % ≙ p2002]	
p0290	Power unit overload response	
	0	Reduce output current or output frequency
	1	No reduction, shutdown when overload threshold is reached
	2	Reduce I_output or f_output and f_pulse (not using I2t).
	3	Reduce the pulse frequency (not using I2t)
p0292	Power unit temperature alarm threshold [°C]	
p0295	Fan run-on time [s]	
Motor		
p0300	Motor type selection	
	0	No motor
	1	Induction motor
	2	Synchronous motor
	17	1LA7 standard induction motor
p0301	Motor code number selection	
p0304	Rated motor voltage [V]	
p0305	Rated motor current [A]	
p0306	Number of motors connected in parallel	
p0307	Rated motor power [kW]	
p0308	Rated motor power factor	
p0309	Rated motor efficiency [%]	
p0310	Rated motor frequency [Hz]	
p0311	Rated motor speed [rpm]	

P-No.	Note
p0320	Motor rated magnetizing current/short-circuit current [A]
p0322	Maximum motor speed [rpm]
p0323	Maximum motor current [A]
r0330	Rated motor slip
r0331	Actual motor magnetizing current/short-circuit current
p0335	Motor cooling type
p0340	Automatic calculation of motor/control parameters
p0341	Motor moment of inertia [kgm²]
p0342	Ratio between the total and motor moment of inertia [kgm²]
r0345	Nominal motor starting time
p0346	Motor excitation build-up time [s]
p0347	Motor de-excitation time [s]
p0350	Motor stator resistance, cold [Ω]
p0352	Cable resistance [Ω]
r0395	Actual stator resistance
r0396	Actual rotor resistance
Technology and units	
p0500	Technology application
p0505	Selecting the system of units
	1 System of units SI
	2 Referred system of units/SI
	3 US system of units
	4 System of units, referred/US
p0573	Inhibit automatic reference value calculation
p0595	Selecting technological units
	1 % / 2 1 referred, no dimensions
	3 bar / 4 °C / 5 Pa
	6 ltr/s / 7 m³/s / 8 ltr/min
	9 m³/min / 10 ltr/h / 11 m³/h
	12 kg/s / 13 kg/min / 14 kg/h
	15 t/min / 16 t/h / 17 N
	18 kN / 19 Nm / 20 psi
	21 °F / 22 gallon/s / 23 inch³/s
	24 gallon/min / 25 inch³/min / 26 gallon/h
	27 inch³/h / 28 lb/s / 29 lb/min
	30 lb/h / 31 lbf / 32 lbf ft
	33 K / 34 rpm / 35 parts/min
	36 m/s / 37 ft³/s / 38 ft³/min
	39 BTU/min / 40 BTU/h / 41 mbar

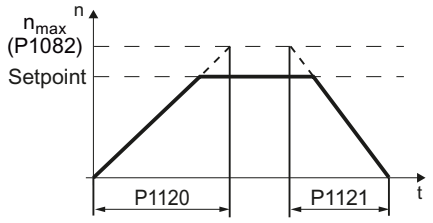
P-No.	Note
	42 inch wg / 43 ft wg / 44 m wg
	45 % r.h. / 46 g/kg
p0596	Reference quantity, technological units
Thermal motor monitoring and motor model, maximum current	
p0601	Motor temperature sensor type
	0 No sensor
	1 PTC warning & timer
	2 KTY84
	4 Bimetallic NC contact warning & timer
p0604	Motor temperature alarm threshold [°C]
p0605	Motor temperature fault threshold [°C]
p0610	Motor overtemperature response
	0 No response, alarm only, no reduction of I_{max}
	1 Alarm with reduction of I_{max} and fault
	2 Alarm and fault, no reduction of I_{max}
p0611	I2t motor model thermal time constant [s]
p0615	I2t motor model fault threshold [°C]
p0625	Motor ambient temperature [°C]
p0637	Q flux, flux gradient saturated [mH]
p0640	Current limit [A]
Command sources and terminals on the Control Unit	
p0700	Command source selection
r0720	CU number of inputs and outputs
r0722	CO/BO: CU digital inputs, status
	.00 DI 0 (terminal 5)
	.01 DI 1 (terminal 6)
	.02 DI 2 (terminal 7)
	.03 DI 3 (terminal 8)
	.04 DI 4 (terminal 16)
	.05 DI 5 (terminal 17)
	.11 DI 11 (terminals 3, 4) AI 0
r0723	CO/BO: CU digital inputs, status inverted
p0730	BI: CU signal source for terminal DO 0
	NO: Terminal 19 / NC: Terminal 18
p0731	BI: CU signal source for terminal DO 1
	NO: Terminal 21
r0747	CU, digital outputs status
p0748	CU, invert digital outputs
r0751	BO: CU analog inputs status word

P-No.	Note	
r0752	CO: CU analog inputs input voltage/current actual AI0 (terminals 3/4)	
r0755	CO: CU analog inputs actual value in percent, AI0 (terminals 3/4) [%]	
p0756	CU analog input type (terminals 3, 4)	
	0	Unipolar voltage input (0 V ... +10 V)
	1	Unipolar voltage input monitored (+2 V... +10 V)
	2	Unipolar current input (0 mA … +20 mA)
	3	Unipolar current input monitored (+4 mA … +20 mA)
	4	Bipolar voltage input (-10 V...+10 V)
	8	No sensor connected
		
p0757	CU analog input characteristic value x1	
p0758	CU analog input characteristic value y1 [%]	
p0759	CU analog input characteristic value x2	
p0760	CU analog input characteristic value y2 [%]	
p0761	CU analog input wire break monitoring response threshold	
p0771	CI: CU analog output signal source, AO 0 (terminals 12, 13) [1 ≙ 100%]	
r0772	CU analog output, output value currently referred	
r0774	CU analog output, output voltage/current actual [100% ≙ p2001]	
p0775	CU analog output activate absolute value generation	
p0776	CU analog output type	
	0	Current output (0 mA ... +20 mA)
	1	Voltage output (0 V... +10 V)
	2	Current output (+4 mA ... +20 mA)

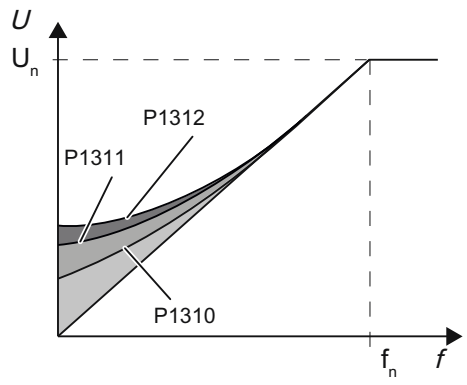
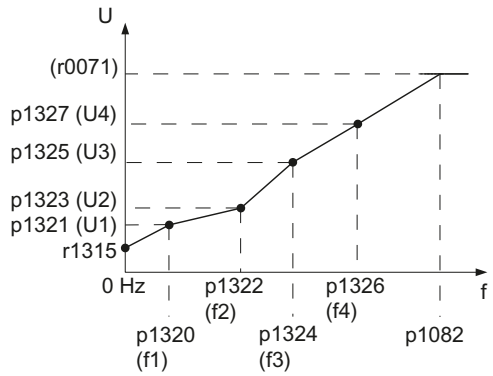
P-No.	Note	
		
p0777	CU analog output characteristic value x1 [%]	
p0778	CU analog output characteristic value y1 [V]	
p0779	CU analog output characteristic value x2 [%]	
p0780	CU analog output characteristic value y2 [V]	
p0782	BI: CU analog output invert signal source, AO 0 (terminals 12,13)	
r0785	BO: CU analog outputs status word	
	.00	1 = AO 0 negative
p0795	CU digital inputs, simulation mode	
p0796	CU digital inputs, simulation mode setpoint	
p0797	CU analog inputs, simulation mode	
p0798	CU analog inputs, simulation mode setpoint	
Change over and copy data sets		
p0802	Data transfer with memory card as source/target	
p0803	Data transfer with device memory as source/target	
p0804	Data transfer start	
	12	Start transfer of the GSD for PROFIBUS master on the memory card
p0806	BI: Inhibit master control	
r0807	BO: Master control active	
p0809	Copy Command Data Set CDS	
p0810	BI: Command data set selection CDS bit 0	
r0835	CO/BO: Data set changeover status word	
r0836	CO/BO: Command data set CDS selected	
Sequence control (e.g. ON/OFF1)		
p0840	BI: ON/OFF (OFF1)	
p0844	BI: No coast down/coast down (OFF2) signal source 1	
p0845	BI: No coast down/coast down (OFF2) signal source 2	
p0848	BI: No quick stop/quick stop (OFF3) signal source 1	
p0849	BI: No quick stop/quick stop (OFF3) signal source 1	

P-No.	Note	
p0852	BI: Operation enable	
p0854	BI: Master control by PLC	
p0855	BI: Unconditionally release holding brake	
p0856	BI: Enable speed controller	
p0858	BI: Unconditionally close holding brake	
r0898	CO/BO: Control word sequence control	
r0899	CO/BO: Status word sequence control	
PROFIBUS, PROFIdrive		
p0918	PROFIBUS address	
p0922	PROFIdrive telegram selection	
	1	Standard telegram 1, PZD-2/2
	20	Standard telegram 20, PZD-2/6
	352	SIEMENS telegram 352, PZD-6/6:
	353	SIEMENS telegram 353, PZD-2/2, PKW-4/4
	354	SIEMENS telegram 354, PZD-6/6, PKW-4/4
	999	Free telegram configuration with BICO
Faults (Part 1)		
r0944	CO: Counter for fault buffer changes	
r0945	Fault code	
r0946	Fault code list	
r0947	Fault number	
r0948	Fault time received in milliseconds [ms]	
r0949	Fault value	
p0952	Fault cases, counter	
r0963	PROFIBUS baud rate	
p0965	PROFIdrive profile number	
p0969	System runtime relative [ms]	
Restoring the factory setting Saving parameters		
p0970	Reset drive parameters	
	0	Inactive
	1	Reset start parameters
	5	Starts a safety parameter reset
	10	Starts to download setting 10
	11	Starts to download setting 11
	12	Starts to download setting 12
	100	Starts a BICO interconnection reset
p0971	Save parameters	
	0	Inactive
	1	Save drive object
	10	Save in a non-volatile memory as setting 10
	11	Save in a non-volatile memory as setting 11
	12	Save in a non-volatile memory as setting 12
p0972	Drive unit reset	
Setpoint channel		
p1000	Speed setpoint selection	
p1001	CO: Fixed speed setpoint 1 [rpm]	
p1002	CO: Fixed speed setpoint 2 [rpm]	
p1003	CO: Fixed speed setpoint 3 [rpm]	
p1004	CO: Fixed speed setpoint 4 [rpm]	
p1005	CO: Fixed speed setpoint 5 [rpm]	
p1006	CO: Fixed speed setpoint 6 [rpm]	
p1007	CO: Fixed speed setpoint 7 [rpm]	
p1008	CO: Fixed speed setpoint 8 [rpm]	
p1009	CO: Fixed speed setpoint 9 [rpm]	
p1010	CO: Fixed speed setpoint 10 [rpm]	
p1011	CO: Fixed speed setpoint 11 [rpm]	
p1012	CO: Fixed speed setpoint 12 [rpm]	
p1013	CO: Fixed speed setpoint 13 [rpm]	
p1014	CO: Fixed speed setpoint 14 [rpm]	
p1015	CO: Fixed speed setpoint 15 [rpm]	
p1016	Fixed speed setpoint mode	
	1	Direct selection
	2	Selection, binary coded
p1020	BI: Fixed speed setpoint selection bit 0	
p1021	BI: Fixed speed setpoint selection bit 1	
p1022	BI: Fixed speed setpoint selection bit 2	
p1023	BI: Fixed speed setpoint selection bit 3	
r1024	CO: Fixed speed setpoint effective [100 % ≙ p2000]	
r1025	BO: Fixed speed setpoint status	
p1030	Motorized potentiometer configuration	
	00	Storage active
	01	Automatic operation, ramp-function generator active
	02	Initial rounding active
	03	Storage in NVRAM active
p1035	BI: Motorized potentiometer setpoint raise	

P-No.	Note
p1036	BI: Motorized potentiometer setpoint lower
p1037	Motorized potentiometer maximum speed [rpm]
p1038	Motorized potentiometer minimum speed [rpm]
p1040	Motorized potentiometer start value [rpm]
p1043	BI: Motorized potentiometer, accept setting value
p1044	CI: Motorized potentiometer setting value [100 % ≙ p2000]
p1047	Motorized potentiometer ramp-up time [s]
p1048	Motorized potentiometer ramp-down time [s]
r1050	CO: Motorized potentiometer setpoint after the ramp-function generator [100 % ≙ p2000]
p1055	BI: Jog bit 0
p1056	BI: Jog bit 1
p1058	Jog 1 speed setpoint [rpm]
p1059	Jog 2 speed setpoint [rpm]
p1070	CI: Main setpoint [100 % ≙ p2000]
p1071	CI: Main setpoint scaling [1 ≙ 100 %]
r1073	CO: Main setpoint effective [100 % ≙ p2000]
p1075	CI: Supplementary setpoint [100 % ≙ p2000]
p1076	CI: Supplementary setpoint scaling [1 ≙ 100 %]
r1077	CO: Supplementary setpoint effective [100 % ≙ p2000]
r1078	CO: Total setpoint effective [100 % ≙ p2000]
p1080	Minimum speed [rpm]
p1082	Maximum speed [rpm]
p1083	CO:Speed limit in positive direction of rotation [rpm]
r1084	CO: Speed limit positive effective [100 % ≙ p2000]
p1086	CO: Speed limit in negative direction of rotation [rpm]
r1087	CO: Speed limit negative effective [100 % ≙ p2000]
p1091	Skip speed 1 [rpm]
p1092	Skip speed 2 [rpm]
p1101	Skip speed bandwidth [rpm]
p1110	BI: Inhibit negative direction
p1111	BI: Inhibit positive direction
p1113	BI: Setpoint inversion
r1114	CO: Setpoint after the direction limiting [100 % ≙ p2000]
r1119	CO: Ramp-function generator setpoint at the input [100 % ≙ p2000]

P-No.	Note	
		
p1120	Ramp-function generator ramp-up time [s]	
p1121	Ramp-function generator ramp-down time [s]	
p1130	Ramp-function generator initial rounding-off time [s]	
p1131	Ramp-function generator final rounding-off time [s]	
p1134	Ramp-function generator rounding-off type	
	0	Continuous smoothing
	1	Discontinuous smoothing
p1135	OFF3 ramp-down time [s]	
p1136	OFF3 initial rounding-off time [s]	
p1137	OFF3 final rounding-off time [s]	
p1140	BI: Ramp-function generator enable	
p1141	BI: Continue ramp-function generator	
p1142	BI: Speed setpoint enable	
r1149	CO: Ramp-function generator acceleration [100 % ≙ p2007]	
r1170	CO: Speed controller setpoint sum [100 % ≙ p2000]	
r1198	CO/BO: Control word, setpoint channel	
	Functions (e.g. motor holding brake)	
p1200	Flying restart operating mode	
	0	Flying restart inactive
	1	Flying restart always active (start in setpoint direction)
	4	Flying restart always active (start only in setpoint direction)
p1201	BI: Flying restart enable signal source	
p1202	Flying restart search current [100 % ≙ r0331]	
p1203	Flying restart search rate factor [%]	
	A higher value results in a longer search time.	
p1206	Set fault number without automatic restart	
p1210	Automatic restart mode	
	0	Inhibit automatic restart
	1	Acknowledge all faults without restarting

P-No.	Note	
	4	Restart after line supply failure, without additional start attempts
	6	Restart after fault with additional start attempts
	14	Restart after line supply failure following manual acknowledgement
	16	Restart after fault following manual acknowledgement
	26	Acknowledging all faults and restarting for an ON command
p1211	Automatic restart, start attempts	
p1212	Automatic restart, delay time start attempts [s]	
p1213	Automatic restart, monitoring time [s]	
p1215	Motor holding brake configuration	
	0	No motor holding brake being used
	3	Motor holding brake like sequential control, connection via BICO
p1216	Motor holding brake, opening time [ms]	
p1217	Motor holding brake, closing time [ms]	
p1230	BI: DC braking activation	
p1231	DC braking configuration	
	0	No function
	4	DC braking
	14	DC braking below starting speed
p1232	DC braking, braking current [A]	
p1233	DC braking time [s]	
p1234	Speed at the start of DC braking [rpm]	
r1239	CO/BO: DC braking status word	
p1240	V_{DC} controller or V_{DC} monitoring configuration (vector control)	
	0	Inhibit V_{DC} controller
	1	Enable V_{DC_max} controller
	2	Enable V_{DC_min} controller (kinetic buffering)
	3	Enable V_{DC_min} controller and V_{DC_max} controller
r1242	V_{DC_max} controller switch-in level [100 % ≙ p2001]	
p1243	V_{DC_max} controller dynamic factor [%]	
p1245	V_{DC_min} controller switch-in level (kinetic buffering) [%]	
r1246	V_{DC_min} controller switch-in level (kinetic buffering) [100 % ≙ p2001]	
p1247	V_{DC_min} controller dynamic factor (kinetic buffering) [%]	
p1249	V_{DC_max} controller speed threshold [rpm]	
p1254	V_{DC_max} controller automatic ON level detection	
	1	Automatic detection enabled
p1255	V_{DC_min} controller time threshold [s]	
p1256	V_{DC_min} controller response (kinetic buffering)	
	0	Buffer V_{DC} until undervoltage, n<p1257 → F07405
	1	Buffer V_{DC} until undervoltage, n<p1257 → F07405, t>p1255 → F07406
p1257	V_{DC_min} controller speed threshold [rpm]	
p1280	V_{DC} controller or V_{DC} monitoring configuration (V/f)	
	0	Inhibit V_{DC} controller
	1	Enable V_{DC_max} controller
	2	Enable V_{DC_min} controller (kinetic buffering)
	3	Enable V_{DC_min} controller and V_{DC_max} controller
r1282	V_{DC_max} controller switch-in level (V/f) [100 % ≙ p2001]	
p1283	V_{DC_max} controller dynamic factor (V/f) [%]	
p1285	V_{DC_min} controller switch-in level (kinetic buffering) (V/f) [%]	
r1286	V_{DC_min} controller switch-in level (kinetic buffering) (V/f) [100 % ≙ p2001]	
p1287	V_{DC_min} controller dynamic factor (kinetic buffering) (V/f) [%]	
p1294	V_{DC_max} controller automatic detection ON signal level (V/f)	
	1	Automatic detection enabled
V/f control		
p1300	Open-loop/closed-loop control operating mode	
	0	V/f control with linear characteristic
	1	V/f control with linear characteristic and FCC
	2	V/f control with parabolic characteristic
	3	V/f control with parameterizable characteristic
	4	V/f control with linear characteristic and ECO
	5	V/f control for drive requiring a precise frequency (e.g. textiles)
	6	V/f control for drive requiring a precise frequency and FCC
	7	V/f control for parabolic characteristic and ECO
	19	V/f control with independent voltage setpoint
	20	Speed control (without encoder)

P-No.	Note
	
p1310	Voltage boost permanent [100 % ≙ p0305]
p1311	Voltage boost when accelerating [%]
p1312	Voltage boost when starting [%]
r1315	Voltage boost, total [100 % ≙ p2001]
	
p1320	V/f control programmable characteristic frequency 1 [Hz]
p1321	V/f control programmable characteristic voltage 1 [V]
p1322	Characteristic frequency 2 [Hz]
p1323	Characteristic voltage 2 [V]
p1324	Characteristic frequency 3 [Hz]
p1325	Characteristic voltage 3 [V]
p1326	Characteristic frequency 4 [Hz]
p1327	Characteristic voltage 4 [V]
p1330	CI: V/f control independent voltage setpoint [100 % ≙ p2001]
p1334	V/f control slip compensation starting frequency [Hz]
p1335	Slip compensation, scaling [100 % ≙ r0330]
p1336	Slip compensation limit value [100 % ≙ r0330]
r1337	CO: Actual slip compensation [1 ≙ 100 %]
p1338	V/f mode resonance damping gain

P-No.	Note
p1340	I_{max} frequency controller proportional gain
p1341	I_{max} frequency controller integral time [s]
r1343	CO: I_max controller frequency output [100 % ≙ p2000]
p1351	CO: Motor holding brake starting frequency [1 ≙ 100 %]
p1352	CI: Motor holding brake starting frequency [1 ≙ 100 %]
Vector control	
r1438	CO: Speed controller speed setpoint [100 % ≙ p2000]
p1452	Speed controller speed actual value smoothing time (SLVC) [ms]
p1470	Speed controller encoderless operation P gain
p1472	Speed controller sensorless operation integral time [ms]
p1475	CI: Speed controller torque setting value for motor holding brake [100 % ≙ p2003]
r1482	CO: Speed controller I torque output [100 % ≙ p2003]
r1493	CO: Moment of inertia, total
p1496	Acceleration pre-control scaling [%]
p1511	CI: Supplementary torque 1 [100 % ≙ p2003]
r1516	CO: Supplementary torque and acceleration torque [100 % ≙ p2003]
p1520	CO: Torque limit upper [Nm]
p1521	CO: Torque limit lower [Nm]
p1522	CI: Torque limit upper [100 % ≙ p2003]
p1523	CI: Torque limit lower [100 % ≙ p2003]
p1524	CO: Torque limit upper/motoring scaling [1 ≙ 100 %]
p1525	CO: Torque limit lower scaling [1 ≙ 100 %]
r1526	CO: Torque limit upper without offset [100 % ≙ p2003]
r1527	CO: Torque limit lower without offset [100 % ≙ p2003]
p1530	Power limit motoring [kW]
p1531	Power limit regenerative [kW]
r1538	CO: Upper effective torque limit [100 % ≙ p2003]
r1539	CO: Lower effective torque limit [100 % ≙ p2003]
r1547	CO: Torque limit for speed controller output
	[0] Upper limit [100 % ≙ p2003]
	[1] Lower limit [100 % ≙ p2003]

P-No.	Note		
p1552	CI: Torque limit upper scaling without offset [1 ≙ 100 %]		
p1554	CI: Torque limit lower scaling without offset [1 ≙ 100 %]		
p1570	CO: Flux setpoint [1 ≙ 100 %]		
p1571	CI: Supplementary flux setpoint [100 % ≙ p2003]		
p1580	Efficiency optimization [%]		
r1598	CO: Flux setpoint total [1 ≙ 100 %]		
p1610	Torque setpoint static (SLVC) [100 % ≙ r0333]		
p1611	Supplementary accelerating torque (SLVC) [100 % ≙ r0333]		
r1732	CO: Direct-axis voltage setpoint [100 % ≙ p2001]		
r1733	CO: Quadrature-axis voltage setpoint [100 % ≙ p2001]		
p1745	Motor model error threshold stall detection [%]		
p1784	Motor model feedback scaling [%]		
Gating unit			
p1800	Pulse frequency setpoint [kHz]		
r1801	CO: Pulse frequency [100 % ≙ p2000]		
p1820	Reverse the output phase sequence		
	1	On	
Motor identification			
p1900	Motor data identification and rotating measurement		
	0	Inhibited	
	1	Identify the motor data at standstill and with the motor rotating	
	2	Identify motor data at standstill	
	3	Identify motor data with the motor rotating	
p1909	Motor data identification control word		
p1910	Motor data identification selection		
p1959	Rotating measurement configuration		
p1960	Rotating measurement selection		
	0	Inhibited	
	1	Rotating measurement in encoderless operation	
	3	Speed controller optimization in encoderless operation	
p1961	Saturation characteristic speed to determine [%]		
p1965	Speed_ctrl_opt speed [100 % ≙ p0310]		
p1967	Speed_ctrl_opt dynamic factor [%]		
Reference values			

P-No.	Note			
p2000	Reference speed reference frequency [rpm]			
p2001	Reference voltage [V]			
p2002	Reference current [A]			
p2003	Reference torque [Nm]			
r2004	Reference power			
p2006	Reference temperature [°C]			
p2010	Commissioning interface baud rate			
p2011	Commissioning interface address			
p2016	CI: Comm IF USS PZD send word			
USS or Modbus RTU				
p2020	Fieldbus interface baud rate:			
	4	2400 baud	5	4800 baud
	6	9600 baud	7	19200 baud
	8	38400 baud	9	57600 baud
	10	76800 baud	11	93750 baud
	12	115200 baud	13	187500 baud
p2021	Fieldbus interface address			
p2022	Fieldbus interface USS PZD number			
p2023	Fieldbus interface USS PKW number			
	0	PKW 0 words	3	PKW 3 words
	4	PKW 4 words	127	PKW variable
p2024	Fieldbus interface times [ms]			
	[0]	Maximum processing time		
	[1]	Character delay time		
	[2]	Telegram pause time		
r2029	Fieldbus interface error statistics			
	[0]	Number of error-free telegrams		
	[1]	Number of rejected telegrams		
	[2]	Number of framing errors		
	[3]	Number of overrun errors		
	[4]	Number of parity errors		
	[5]	Number of starting character errors		
	[6]	Number of checksum errors		
	[7]	Number of length errors		
p2030	Fieldbus interface protocol selection			
	0	No protocol		
	1	USS		
	2	MODBUS		
	3	PROFIBUS		
	4	CAN		
r2032	Master control, control word effective			

P-No.	Note				
	.00	ON / OFF1			
	.01	OFF2 inactive			
	.02	OFF3 inactive			
	.03	Operation enable			
	.04	Ramp-function generator enable			
	.05	Start ramp-function generator			
	.06	Speed setpoint enable			
	.07	Acknowledge fault			
	.08	Jog bit 0			
	.09	Jog bit 1			
	.10	Master control by PLC			
p2037	PROFIdrive STW1.10 = 0 mode				
	0	Freeze setpoints and further process sign-of-life			
	1	Freeze setpoints and sign-of-life			
	2	Setpoints are not frozen			
p2038	PROFIdrive STW/ZSW interface mode				
	0	SINAMICS			
	2	VIK-NAMUR			
p2040	Fieldbus interface monitoring time [ms]				
PROFIBUS, PROFIdrive					
p2042	PROFIBUS ID Number				
	0	SINAMICS			
	2	VIK-NAMUR			
r2043	BO: PROFIdrive PZD state				
	.00	Setpoint failure			
	.02	Fieldbus operational			
p2044	PROFIdrive fault delay [s]				
p2047	PROFIBUS additional monitoring time [ms]				
r2050	CO: PROFIdrive PZD receive word				
	[0]	PZD 1	…	[7]	PZD 8
p2051	CI: PROFIdrive PZD send word				
	[0]	PZD 1	…	[7]	PZD 8
r2053	PROFIdrive diagnostics send PZD word				
	[0]	PZD 1	…	[7]	PZD 8
r2054	PROFIBUS status				
	0	OFF			
	1	No connection (search for baud rate)			
	2	Connection OK (baud rate found)			
	3	Cyclic connection with master (data exchange)			
	4	Cyclic data OK			

P-No.	Note				
r2055	PROFIBUS diagnosis standard				
	[0]	Master bus address			
	[1]	Master input total length bytes			
	[2]	Master output total length bytes			
r2074	PROFIdrive diagnostics bus address PZD receive				
	[0]	PZD 1	…	[7]	PZD 8
r2075	PROFIdrive diagnostics telegram offset PZD receive				
	[0]	PZD 1	…	[7]	PZD 8
r2076	PROFIdrive diagnostics telegram offset PZD send				
	[0]	PZD 1	…	[7]	PZD 8
r2077	PROFIBUS diagnostics peer-to-peer data transfer addresses				
p2079	PROFIdrive PZD telegram selection extended				
	See p0922				
p2080	BI: Binector-connector converter, status word 1				
	The individual bits are combined to form status word 1.				
p2088	Binector-connector converter, invert status word				
r2089	CO: Send binector-connector converter status word				
	[0]	Status word 1			
	[1]	Status word 2			
	[2]	Free status word 3			
	[3]	Free status word 4			
	[4]	Free status word 5			
r2090	BO: PROFIdrive PZD1 receive bit-serial				
r2091	BO: PROFIdrive PZD2 receive bit-serial				
r2092	BO: PROFIdrive PZD3 receive bit-serial				
r2093	BO: PROFIdrive PZD4 receive bit-serial				
r2094	BO: Connector-binector converter binector output				
r2095	BO: Connector-binector converter binector output				
Faults (Part 2) and alarms					
p2100	Setting the fault number for fault response				
p2101	Setting the fault response				
	0	None	1	OFF1	
	2	OFF2	3	OFF3	
	5	STOP2	6	DC braking	
p2103	BI: 1. Acknowledge faults				
p2104	BI: 2. Acknowledge faults				
p2106	BI: External fault 1				
r2110	Alarm number				

P-No.	Note
p2111	Alarm counter
p2112	BI: External alarm 1
r2122	Alarm code
r2123	Alarm time received [ms]
r2124	Alarm value
r2125	Alarm time removed [ms]
p2126	Setting fault number for acknowledge mode
p2127	Sets acknowledgement mode
p2128	Selecting fault/alarm code for trigger
r2129	CO/BO: Trigger word for faults and alarms
r2130	Fault time received in days
r2133	Fault value for float values
r2134	Alarm value for float values
r2135	CO/BO: Status word, faults/alarms 2
r2136	Fault time removed in days
r2138	CO/BO: Control word, faults/alarms
r2139	CO/BO: Status word, faults/alarms 1
r2169	CO: Actual speed smoothed signals
r2197	CO/BO: Status word monitoring functions 1
r2198	CO/BO: Status word monitoring 2
r2199	CO/BO: Status word monitoring 3
Technology controller	
p2200	BI: Technology controller enable
p2201	CO: Techn. controller fixed value 1 [1 ≙ 100%]
p2202	CO: Techn. controller fixed value 2 [1 ≙ 100%]
p2203	CO: Techn. controller fixed value 3 [1 ≙ 100%]
p2204	CO: Techn. controller fixed value 4 [1 ≙ 100%]
p2205	CO: Techn. controller fixed value 5 [1 ≙ 100%]
p2206	CO: Techn. controller fixed value 6 [1 ≙ 100%]
p2207	CO: Techn. controller fixed value 7 [1 ≙ 100%]
p2208	CO: Techn. controller fixed value 8 [1 ≙ 100%]
p2209	CO: Techn. controller fixed value 9 [1 ≙ 100%]
p2210	CO: Techn. controller fixed value 10 [1 ≙ 100%]
p2211	CO: Techn. controller fixed value 11 [1 ≙ 100%]
p2212	CO: Techn. controller fixed value 12 [1 ≙ 100%]
p2213	CO: Techn. controller fixed value 13 [1 ≙ 100%]
p2214	CO: Techn. controller fixed value 14 [1 ≙ 100%]
p2215	CO: Techn. controller fixed value 15 [1 ≙ 100%]
p2216	Techn. controller fixed value selection method
	0 Fixed value selection direct
	1 Fixed value selection binary

P-No.	Note
p2220	BI: Techn. controller fixed value selection bit 0
p2221	BI: Techn. controller fixed value selection bit 1
p2222	BI: Techn. controller fixed value selection bit 2
p2223	BI: Techn. controller fixed value selection bit 3
r2224	CO: Techn. controller fixed value active [1 ≙ 100%]
r2225	CO/BO: Techn. controller fixed value selection status word
r2229	Techn. controller number currently
p2230	Techn. controller motorized potentiometer configuration
	.00 Storage active
	.02 Initial rounding active
	.03 Non-volatile data save active for p2230.0 = 1
	.04 Ramp-function generator always active
r2231	Techn. controller motorized potentiometer setpoint memory
p2235	BI: Techn. controller motorized potentiometer setpoint up
p2236	BI: Techn. controller motorized potentiometer setpoint down
p2237	Techn. controller motorized potentiometer maximum value [%]
p2238	Techn. controller motorized potentiometer minimum value [%]
p2240	Techn. controller motorized potentiometer start value [%]
r2245	CO: Techn. controller motorized potentiometer setpoint before RFG [1 ≙ 100%]
p2247	Techn. controller motorized potentiometer ramp-up time [s]
p2248	Techn. controller motorized potentiometer ramp-down time [s]
r2250	CO: Techn. controller motorized potentiometer setpoint after RFG [1 ≙ 100%]
p2251	Techn. controller mode
	0 Techn. controller as main speed setpoint
	1 Techn. controller as additional speed setpoint
p2253	CI: Techn. controller setpoint 1 [1 ≙ 100%]
p2254	CI: Techn. controller setpoint 2 [1 ≙ 100%]
p2255	Techn. controller setpoint 1 scaling [%]
p2256	Techn. controller setpoint 2 scaling [%]
p2257	Techn. controller ramp-up time [s]
p2258	Techn. controller ramp-down time [s]

P-No.	Note			
r2260	CO: Techn. controller setpoint after ramp function generator [1 ≙ 100%]			
p2261	Techn. controller setpoint filter time constant [s]			
p2263	Techn. controller type			
	0	D component in the actual value signal		
	1	D component in the fault signal		
p2264	CI: Techn. controller actual value [1 ≙ 100%]			
p2265	Techn. controller actual value filter time constant [s]			
r2266	CO: Techn. controller actual value after filter [1 ≙ 100%]			
p2267	Techn. controller upper limit actual value [1 ≙ 100%]			
p2268	Techn. controller lower limit actual value [1 ≙ 100%]			
p2269	Techn. ontroller gain actual value [%]			
p2270	Techn. controller actual value function selection			
	0	No function	1	√x
	2	x²	3	x³
p2271	Techn. controller actual value inversion (sensor type)			
	1	In version of the technology controller actual value signal		
r2272	CO: Techn. controller actual value scaled [1 ≙ 100%]			
r2273	CO: Techn. controller error [1 ≙ 100%]			
p2274	Techn. controller actual differentiation time constant [s]			
p2280	Techn. controller proportional gain			
p2285	Techn. controller integral time [s]			
p2286	BI: Hold techn. controller integrator			
p2289	CI: Techn. controller pre-control signal [1 ≙ 100%]			
p2291	CO: Techn. controller maximum limit [1 ≙ 100%]			
p2292	CO: Techn. controller minimum limit [1 ≙ 100%]			
p2293	Techn. controller ramp-up/ramp-down time [s]			
r2294	CO: Techn. controller output signal [1 ≙ 100%]			
p2295	CO: Techn. controller output scaling [1 ≙ 100%]			
p2296	CI: Techn. controller output scaling [1 ≙ 100%]			
p2297	CI: Techn. controller maximum limit signal source [1 ≙ 100%]			
p2298	CI: Techn. controller minimum limit signal source [1 ≙ 100%]			
p2299	CI: Techn. controller limit offset [1 ≙ 100%]			
p2302	Techn. controller output signal start value [%]			
p2306	Techn. controller fault signal inversion			

P-No.	Note	
	1	Inversion of the techn. controller fault signal
r2344	CO: Techn. controller last speed setpoint (smoothed) [1 ≙ 100%]	
p2345	Techn. controller fault response	
	0	Function inhibited
	1	For a fault: change over to r2344 (or p2302)
	2	For a fault: Change over to p2215
r2349	CO/BO: Techn. controller status word	
p2900	CO: Fixed value 1 [%]	
p2901	CO: Fixed value 2 [%]	
r2902	CO: Fixed values [%]	
p2930	CO: Fixed value M [Nm]	
Messages		
r3113	CO/BO: NAMUR message bit bar	
Motor characteristic		
p3320	Fluid flow machine P = f(n), Y coordinate: P flow 1%, point 1	
p3321	Fluid flow machine P = f(n), X coordinate: n flow 1%, point 1	
p3322	P = f(n), Y coordinate: P flow 2%, point 2	
p3323	P = f(n), X coordinate: n flow 2%, point 2	
p3324	P = f(n), Y coordinate: P flow 3%, point 3	
p3325	P = f(n), X coordinate: n flow 3%, point 3	
p3326	P = f(n), Y coordinate: P flow 4%, point 4	
p3327	P = f(n), X coordinate: n flow 4%, point 4	
p3328	P = f(n), Y coordinate: P flow 5%, point 5	
p3329	P = f(n), X coordinate: n flow 5%, point 5	
Two/three wire control		
p3330	BI: 2-3 wire control 1	
p3331	BI: 2-3 wire control 2	
p3332	BI: 2-3 wire control 3	
r3333	CO/BO: 2-3 wire output	
	.00	2-3 wire ON
	.01	2-3 wire reverse
	.02	2-3 wire ON / invert
	.03	2-3 wire reverse/invert
p3334	2-3 wire selection	
	0	No 2-3 wire control
	1	2-wire forward/backward 1
	2	2-wire forward/backward 2

P-No.	Note					
	3	3-wire enable / forward / backward				
	4	3-wire enable / ON / reverse				
Compound braking						
p3856	Compound braking current [%]					
r3859	CO/BO: Compound braking status word					
Administration parameters						
p3900	Completion of quick commissioning					
r3925	Identification final display					
p3950	Service parameters					
p3981	Faults, acknowledge drive object					
p3985	Master control mode selection					
r3996	Parameter write inhibit status					
p7760	Adjustable parameters write protection					
	1	Active				
r8570	Macro drive object					
CANopen						
r8600	CAN Device Type					
r8601	CAN Error Register					
p8602	CAN SYNC-Object					
p8603	CAN COB-ID Emergency Message [hex]					
p8604	CAN Node Guarding					
p8606	CAN Producer Heartbeat Time [ms]					
r8607	CAN Identity Object					
p8608	CAN Clear Bus Off Error					
p8609	CAN Error Behavior					
r8610	CAN First Server SDO					
p8611	CAN Pre-defined Error Field [hex]					
p8620	CAN Node-ID					
r8621	CAN Node-ID effective					
p8622	CAN bit rate [kBit/s]					
	0	1000	1	800	2	500
	3	250	4	125	5	50
	6	20	7	10		
p8623	CAN Bit Timing selection [hex]					
p8630	CAN virtual objects					
p8641	CAN Abort Connection Option Code					
	0	No response	1	OFF1		
	2	OFF2	3	OFF3		
r8680	CAN Diagnosis Hardware					
p8684	CAN NMT state after booting					

P-No.	Note	
p8685	CAN NMT state	
p8699	CAN RPDO monitoring time [ms]	
p8700	CAN Receive PDO 1 [hex]	
p8701	CAN Receive PDO 2 [hex]	
p8702	CAN Receive PDO 3 [hex]	
p8703	CAN Receive PDO 4 [hex]	
p8704	CAN Receive PDO 5 [hex]	
p8705	CAN Receive PDO 6 [hex]	
p8706	CAN Receive PDO 7 [hex]	
p8707	CAN Receive PDO 8 [hex]	
p8710	CAN Receive Mapping for RPDO 1 [hex]	
p8711	CAN Receive Mapping for RPDO 2 [hex]	
p8712	CAN Receive Mapping for RPDO 3 [hex]	
p8713	CAN Receive Mapping for RPDO 4 [hex]	
p8714	CAN Receive Mapping for RPDO 5 [hex]	
p8715	CAN Receive Mapping for RPDO 6 [hex]	
p8716	CAN Receive Mapping for RPDO 7 [hex]	
p8717	CAN Receive Mapping for RPDO 8 [hex]	
p8720	CAN Transmit PDO 1 [hex]	
p8721	CAN Transmit PDO 2 [hex]	
p8722	CAN Transmit PDO 3 [hex]	
p8723	CAN Transmit PDO 4 [hex]	
p8724	CAN Transmit PDO 5 [hex]	
p8725	CAN Transmit PDO 6 [hex]	
p8726	CAN Transmit PDO 7 [hex]	
p8727	CAN Transmit PDO 8 [hex]	
p8730	CAN Transmit Mapping for TPDO 1 [hex]	
p8731	CAN Transmit Mapping for TPDO 2 [hex]	
p8732	CAN Transmit Mapping for TPDO 3 [hex]	
p8733	CAN Transmit Mapping for TPDO 4 [hex]	
p8734	CAN Transmit Mapping for TPDO 5 [hex]	
p8735	CAN Transmit Mapping for TPDO 6 [hex]	
p8736	CAN Transmit Mapping for TPDO 7 [hex]	
p8737	CAN Transmit Mapping for TPDO 8 [hex]	
p8741	CAN PDO configuration acknowledgment	
p8744	CAN PDO Mapping Configuration	
	1:	Predefined connection set
	2:	Free PDO mapping
r8750	CAN mapped receive objects 16 bit	
r8751	CAN mapped receive objects 16 bit	
r8784	CO: CAN status word	
r8785	BI: CAN status word bit 8	

P-No.	Note	
p8786	BI: CAN status word bit 14	
p8787	BI: CAN status word bit 15	
p8790	CAN control word - auto interconnection	
r8795	CAN control word	
r8797	CAN Target Torque	
PROFIdrive		
r8820	Identification and Maintenance 0	
p8991	USB memory access	
Parameter consistency and storage		
p9400	Safely remove memory card	
	0	No memory card inserted
	1	Memory card inserted
	2	Request "safe removal" of the memory card
	3	"Safe removal" possible
	100	"Safe removal" not possible due to access
r9401	Safely remove memory card status	
r9463	Set valid macro	
p9484	BICO interconnections, search signal source	
r9485	BICO interconnections, search signal source number	
r9486	BICO interconnections, search signal source first index	
Safety Integrated		
p9601	SI enable, functions integrated in the drive (processor 1)	
p9610	SI PROFIsafe address (processor 1)	
p9650	SI F-DI changeover, tolerance time (processor 1) [ms]	
p9651	SI STO debounce time (processor 1) [ms]	
p9659	SI forced checking procedure timer [h]	
r9660	SI forced checking procedure remaining time	
p9700	SI copy function	
p9701	Acknowledge SI data change	
p9761	SI password input [hex]	
p9762	SI password new [hex]	
p9763	SI password acknowledgment [hex]	
r9770	SI version, safety functions integrated in the drive (processor 1)	
r9771	SI common functions (processor 1)	
r9772	CO/BO: SI status (processor 1)	

P-No.	Note	
r9773	CO/BO: SI status (processor 1 + processor 2)	
r9780	SI monitoring clock cycle (processor 1)	
r9781	SI checksum to check changes (processor 1)	
r9782	SI time stamp to check changes (processor 1)	
r9794	SI crosswise comparison list (processor 1)	
r9795	SI diagnostics, STOP F (processor 1)	
r9798	SI actual checksum SI parameters (processor 1)	
p9799	SI reference checksum SI parameters (processor 1)	
p9801	SI enable, functions integrated in the drive (processor 2)	
p9810	SI PROFIsafe address (processor 2)	
p9850	SI F-DI changeover, tolerance time (processor 2)	
p9851	SI STO debounce time (processor 2)	
r9871	SI common functions (processor 2)	
r9872	CO/BO: SI status (Power Module)	
r9898	SI actual checksum SI parameters (processor 2)	
p9899	SI reference checksum SI parameters (processor 2)	
Diagnostics (internal)		
r9976	System utilization	
	[1]	Computation time utilization
	[5]	Highest gross utilization

Trouble shooting

6

6.1 List of alarms and faults

Axxxxx Alarm

Fyyyyy: Fault

Table 6- 1 The most important alarms and faults of the safety functions

Number	Cause	Remedy
F01600	STOP A initiated	Select STO and then deselect again
F01650	Acceptance test required	Carry out acceptance test and create test certificate. Switch the Control Unit off and then on again.
F01659	Write task for parameter rejected	Cause: A parameter reset was selected. The fail-safe parameters have not yet been reset, as the safety functions are enabled Remedy: block safety functions or reset fail-safe parameters (p0970 = 5), then reset the drive parameters once again.
A01666	Static 1 signal on the F-DI for secure acknowledgement	Setting F-DI to logical 0 signal
A01698	Commissioning mode active for safety functions	This message is withdrawn after the safety functions have been commissioned
A01699	Shutdown path test required	After the next time that the "STO" function is deselected, the message is withdrawn and the monitoring time is reset
F30600	STOP A initiated	Select STO and then deselect again

Table 6- 2 The most important alarms and faults

Number	Cause	Remedy
F01018	Power-up aborted more than once	1. Switch the module off and on again. 2. After this fault has been output, the module is booted with the factory settings. 3. Recommission the inverter.
A01028	Configuration error	Explanation: Parameterization on the memory card has been created with a different type of module (order number, MLFB) Check the module parameters and recommission if necessary.
F01033	Unit switchover: Reference parameter value invalid	Set the value of the reference parameter not equal to 0.0 (p0304, p0305, p0310, p0596, p2000, p2001, p2002, p2003, r2004).
F01034	Unit switchover: Calculation of the parameter values after reference value change unsuccessful	Select the value of the reference parameter so that the parameters involved can be calculated in the per unit notation (p0304, p0305, p0310, p0596, p2000, p2001, p2002, p2003, r2004).
F01122	Frequency at the probe input too high	Reduce the frequency of the pulses at the probe input.

Number	Cause	Remedy
A01590	Motor maintenance interval lapsed	Carry out the maintenance.
A01900	PROFIBUS: Configuration telegram faulty	Explanation: A PROFIBUS master is attempting to establish a connection with a faulty configuration telegram. Check the bus configuration on the master and slave side.
F01910	Fieldbus SS setpoint timeout	Check the bus connection and communication partner, e.g. switch the PROFIBUS master to the RUN status.
A01920	PROFIBUS: Cyclic connection interrupt	Explanation: The cyclic connection to PROFIBUS master is interrupted. Establish the PROFIBUS connection and activate the PROFIBUS master with cyclic operation.
F03505	Analog input, wire break	Check the connection to the signal source for interrupts. Check the level of the signal supplied. The input current measured by the analog input can be read out in r0752.
A03520	Temperature sensor fault	Check that the sensor is connected correctly.
A05000 A05001 A05002 A05004 A05006	Power Module overtemperature	Check the following: - Is the ambient temperature within the defined limit values? - Are the load conditions and duty cycle configured accordingly? - Has the cooling failed?
F06310	Supply voltage (p0210) incorrectly parameterized	Check the parameterized supply voltage and if required change (p0210). Check the line voltage.
F07011	Motor overtemperature	Reduce the motor load. Check ambient temperature. Check sensor's wiring and connection.
A07012	I2t Motor Module overtemperature	Check and if necessary reduce the motor load. Check the motor's ambient temperature. Check thermal time constant p0611. Check overtemperature fault threshold p0605.
A07015	Motor temperature sensor alarm	Check that the sensor is connected correctly. Check the parameter assignment (p0601).
F07016	Motor temperature sensor fault	Make sure that the sensor is connected correctly. Check the parameterization (p0601).
F07086 F07088	Unit switchover: Parameter limit violation	Check the adapted parameter values and if required correct.
F07320	Automatic restart aborted	Increase the number of restart attempts (p1211). The current number of start attempts is shown in r1214. Increase the wait time in p1212 and/or monitoring time in p1213. Create ON command (p0840). Increase the monitoring time of the power unit or switch off (p0857). Reduce the wait time for resetting the fault counter p1213[1] so that fewer faults are registered in the time interval.
A07321	Automatic restart active	Explanation: The automatic restart (AR) is active. During voltage recovery and/or when remedying the causes of pending faults, the drive is automatically switched back on.
F07330	Search current measured too low	Increase search current (P1202), check motor connection.

Number	Cause	Remedy
A07400	V_{DC_max} controller active	If the controller is not to intervene: • Increase the ramp-down times. • Deactivate the V_{DC_max} controller (p1240 = 0 for vector control, p1280 = 0 for V/f control).
A07409	V/f control current limiting controller active	The alarm automatically disappears after one of the following measures: • Increase the current limit (p0640). • Reduce load. • Increase the ramp-up time to the speed setpoint.
F07426	Technology controller actual value limited	• Adapt the limits to the signal level (p2267, p2268). • Check the actual value scaling (p2264).
F07801	Motor overcurrent	Check current limits (p0640). U/f control: Check the current limiting controller (p1340 … p1346). Increase acceleration ramp (p1120) or reduce load. Check motor and motor cables for short circuit and ground fault. Check motor for star-delta connection and rating plate parameterization. Check power unit / motor combination. Select flying restart function (p1200) if switched to rotating motor.
A07805	Drive: Power unit overload I2t	• Reduce the continuous load. • Adapt the load cycle. • Check the assignment of rated currents of the motor and power unit.
A07850	External alarm 1	The signal for "external alarm 1" has been triggered. Parameter p2112 defines the signal source of the external alarm. Remedy: Rectify the cause of this alarm.
F07901	Motor overspeed	Activate precontrol of the speed limiting controller (p1401 bit 7 = 1).
F07902	Motor stalled	Check whether the motor data has been parameterized correctly and perform motor identification. Check the current limits (p0640, r0067, r0289). If the current limits are too low, the drive cannot be magnetized. Check whether motor cables are disconnected during operation.
A07910	Motor overtemperature	Check the motor load. Check the motor's ambient temperature. Check the KTY84 sensor.
A07920	Torque/speed too low	The torque deviates from the torque/speed envelope curve. • Check the connection between the motor and the load. • Adapt the parameterization corresponding to the load.
A07921	Torque/speed too high	
A07922	Torque/speed out of tolerance	
F07923	Torque/speed too low	• Check the connection between the motor and the load. • Adapt the parameterization corresponding to the load.
F07924	Torque/speed too high	
A07927	DC braking active	Not required
A07980	Rotary measurement activated	Not required

Number	Cause	Remedy
A07981	No enabling for rotary measurement	Acknowledge pending faults. Establish missing enables (see r00002, r0046).
A07991	Motor data identification activated	Switch on the motor and identify the motor data.
F30001	Overcurrent	Check the following: • Motor data, if required, carry out commissioning • Motor's connection method (Y / Δ) • U/f operation: Assignment of rated currents of motor and Power Module • Line quality • Make sure that the line commutating reactor is connected properly • Power cable connections • Power cables for short-circuit or ground fault • Power cable length • Line phases If this doesn't help: • U/f operation: Increase the acceleration ramp • Reduce the load • Replace the power unit
F30005	I2t inverter overload	Check the rated currents of the motor and Power Module. Reduce current limit p0640. When operating with U/f characteristic: Reduce p1341.
F30011	Line phase failure	Check the inverter's input fuses. Check the motor cables.
F30015	Motor cable phase failure	Check the motor cables. Increase the ramp-up or ramp-down time (p1120).
F30021	Ground fault	• Check the power cable connections. • Check the motor. • Check the current transformer. • Check the cables and contacts of the brake connection (a wire might be broken).
F30027	Time monitoring for DC link pre-charging	Check the supply voltage on the input terminals. Check the line voltage setting (p0210).
F30035	Overtemperature, intake air	• Check whether the fan is running. • Check the fan filter elements. • Check whether the ambient temperature is in the permissible range.
F30036	Overtemperature, inside area	
F30037	Rectifier overtemperature	See F30035 and, in addition: • Check the motor load. • Check the line phases
A30049	Internal fan defective	Check the internal fan and if required replace.
F30059	Internal fan defective	Check the internal fan and if required replace.

Number	Cause	Remedy
A30502	DC link overvoltage	• Check the device supply voltage (p0210). • Check the line reactor dimensioning
A30920	Temperature sensor fault	Check that the sensor is connected correctly.

For further information, please refer to the List Manual.

6.2 Further information

Table 6- 3 Technical Support

France	Germany	Italy	Spain	United Kingdom
+33 (0) 821 801 122	+49 (0)911 895 7222	+39 (02) 24362000	+34 902 237 238	+44 161 446 5545
Further service telephone numbers: Product support (http://support.automation.siemens.com/WW/view/en/4000024)				

Table 6- 4 Manuals with further information

Information level	Manual	Content	Available languages	Download or order number
+	Getting Started	(this manual)	English, German, Italian, French, Spanish, Turkish, Chinese	Documentation download (http://support.automation.siemens.com/WW/view/en/36426537/133300) Order numbers: **SD Manual Collection (DVD)** • 6SL3298-0CA00-0MG0 Supplied once • 6SL3298-0CA10-0MG0 Update service for 1 year; supplied 4 times
++	Operating instructions - inverter	Installing, commissioning and operating the inverter. Description of inverter functions. Technical data.		
+++	Function Manual Safety Integrated	Configuring PROFIsafe. Installing, commissioning and operating the integrated fail-safe function.	English, German	
+++	List manual	Complete list of parameters, alarms and faults. Graphic function block diagrams.		
+++	Operating instructions - BOP-2, IOP	Description of operator panel		

Table 6- 5 Spare parts

		Order number
Spare part kit including 5 sets I/O terminals, 1 door set and 1 blind cover		6SL3200-0SK40-0AA0
Screening plates	Frame size A	6SL3266-1EA00-0KA0
	Frame size B	6SL3266-1EB00-0KA0
	Frame size C	6SL3266-1EC00-0KA0
1 set of connector plugs (mains, motor and breaking resistor)	Frame size A	6SL3200-0ST05-0AA0
	Frame size B	6SL3200-0ST06-0AA0
	Frame size C	6SL3200-0ST07-0AA0
Fan units	Frame size A	6SL3200-0SF12-0AA0
	Frame size B	6SL3200-0SF13-0AA0
	Frame size C	6SL3200-0SF14-0AA0
Top cover with built in fan	Frame size A	6SL3200-0SF40-0AA0
	Frame size B	6SL3200-0SF41-0AA0
	Frame size C	6SL3200-0SF42-0AA0

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